

**ASSESSMENT OF FOOD SERVICE DELIVERY
TO ELDERLY RESIDENTS IN
LONG TERM CARE FACILITIES**

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By

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ABSTRACT

The purpose of this study was to assess food service delivery provided to elderly long term care (LTC) residents. The sample was drawn from the 18 LTC facilities located in Saskatoon District Health, Saskatoon, Saskatchewan. The study was conducted in four phases: 1) Menu Analysis; 2) Resident Food Service Satisfaction; 3) Food Service Practices; and 4) Dietary Intakes of the Elderly. The study methodology included a 7-day nutrient analysis of cycle menus of 11 LTC facilities, a food service satisfaction survey (n=205 elderly residents), a LTC survey examining menu planning practices (n=11 LTC facilities), and a 3-day dietary intake analysis (n=48 elderly residents) using weighed and observation dietary assessment methods. LTC facility menus did not meet the recommended levels (< 100% Recommended Dietary Allowance; RDA or Adequate Intake; AI) of vitamin E (males & females: 69% RDA), vitamin C (males: 87% RDA), niacin (males: 98% RDA), vitamin B₆ (males: 76% RDA; females: 87% RDA), folate (males & females: 47% RDA), magnesium (males: 63% RDA; females: 82% RDA), zinc (males: 80% RDA), calcium (males & females: 84% AI), and vitamin D (males & females: 51-70 yrs, 69%; 70+ yrs, 46%). Energy was 88% Recommended Nutrient Intake (RNI) for males 50-74 yrs. Dietary fibre content was low (14 g/day) for both gender groups. LTC facility menus did not provide the recommended number of servings of vegetables and fruit, and grain products compared to Canada's Food Guide to Healthy Eating. Snacks provided by LTC facilities were nutrient dense, covered the four food groups, but were not consistently offered to all residents. Using the Estimated Average Requirement (EAR) cut-point method and the observation method of dietary assessment, the percentage of subjects below the EAR was used to determine the nutrient adequacy of the group of elderly subjects. The percentage of subjects below the EAR for specific nutrients were: folate (96%), magnesium (96%), zinc (79%), vitamin E (77%), vitamin B₆ (73%), vitamin C (46%), niacin (31%), thiamin (29%), and vitamin B₁₂ (19%), even with the consumption of foods between meals (i.e., snacks). Overall, residents were satisfied with food services provided and quality of life issues to eating. Dissatisfaction was shown by low positive (< 80%) responses to: food quality (75%),

variety (70%), taste (75%), and appearance (77%), and awareness of the menu (64%). Lack of autonomy was addressed through low positive responses for food choice (70%) and snack accessibility (73%). To help improve the monitoring of food services delivered to populations at risk for inadequate nutrition, the ROCIE Food Service Systems Model was established from the existing model by Vaden (1980). The ROCIE model consists of five synergistic components: Resources, Outcomes, Controlling Factors, Indicators, and Environmental Context. The model illustrates the dynamic relationship that exists between all of the components of the LTC food service system and provides insight into understanding how LTC food services operate. This model will assist health care providers in understanding the role internal and external factors play in influencing food intake of LTC residents.

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LIST OF ABBREVIATIONS

AI	adequate intake
CAU	Coordinated Assessment Unit
CCHSA	Canadian Council on Health Services Accreditation
CFGHE	Canada's Food Guide to Healthy Eating
CNF	Canadian Nutrient File
DRI	dietary reference intake
EAR	estimated average requirement
F	female
g	gram
GST	General Systems Theory
kcal	kilocalorie
LTC	long term care
M	male
mg	milligram
NPHS	National Population Health Survey
RDA	recommended dietary allowance
RE	retinol equivalent
ROCIE	Resources, Outcomes, Controlling Factors, Indicators, and Environmental Context
RNI	recommended nutrient intake
SDH	Saskatoon District Health
μg	microgram
UL	tolerable upper intake level
USDA	United States Department of Agriculture
WHO	World Health Organization
y	year

CHAPTER 1

INTRODUCTION

1.1 Rationale

Canada's population is aging at an exponential rate, contributing to a greater proportion of individuals 65 years of age and older than in previous years. The majority of elderly residents, individuals 65 years of age and older, live in their own homes (Statistics Canada, 1999), but as one ages, the likelihood of institutional care increases (Novak, 1997). Long term care (LTC) facilities provide 24 hour care and support services to individuals from a variety of ages with a wide range of medical problems.

Concerns arise when examining nutritional care provided to elderly LTC residents. The elderly residing in LTC facilities are at risk for compromised nutritional care (Institute of Medicine, 2000b) and diminished autonomy (Pratt, 1999; Clark, 1988). Malnutrition is prevalent in these facilities (Laporte, Villalon & Payette, 2001), which may contribute to increased morbidity and mortality, in addition to decreased quality of life. With the increase of LTC admissions of elderly, finding ways to enhance their autonomy and provide quality nutritional care poses major challenges.

Health reform beginning in 1992 changed the way health care was governed in the Province of Saskatchewan (Saskatchewan Health, 2000). Health districts were created to shift health care responsibilities from individual health care organizations to specific district boundaries in order to increase services provided to residents and for efficiency. District health boards were established for planning, managing, and delivering health services to their district residents. Prior to health reform, food service delivery and nutritional care in LTC facilities were monitored by a dietetic consultant, but this position

has since been eliminated. Therefore, health reform has precipitated the need to assess whether special needs groups like LTC residents are receiving proper and adequate nutrition and food services. From these assessment efforts, policy makers can use this information to make informed decisions about nutritional care and food service delivery systems that serve the elderly residing in LTC facilities.

To ensure that LTC residents are receiving good nutrition to prevent and alleviate further medical problems, it is critical that health care professionals understand the processes involved in quality nutrition and food service delivery. The purpose of this study was to assess food services provided to a sample of elderly LTC home residents, with respect to their nutritional needs, quality of life, and food service satisfaction. The study was conducted in four phases:

- 1) Menu Analysis - examined the nutritional adequacy and variety of regular non-therapeutic menus;
- 2) Food Service Satisfaction - assessed the satisfaction elderly residing in LTC facilities have in regards to food services and quality of life issues related to eating;
- 3) Food Service Practices - examined the current menu planning practices utilized by LTC facilities;
- 4) Dietary Intakes of the Elderly - determined the amount of energy and nutrients consumed by elderly residents on regular, non-therapeutic diets using two dietary assessment methods, observation and weighed.

These research phases are discussed in detail in chapters 4, 5 and 6.

1.2 Hypotheses

The research project tested the following five hypotheses:

1. Saskatoon District Health (SDH) LTC facilities provide an adequate amount and variety of nutrient dense foods that meet the elderly residents' nutritional needs (Phase 1).
2. The elderly residing in SDH LTC facilities consume an adequate supply of energy,

macronutrients, vitamins, minerals, and dietary fibre (Phase 4).

3. The observation method is a reliable and valid tool for measuring dietary intakes of institutionalized elderly (Phase 4).

1.3 Objectives

The objectives of the study were:

1. To determine current menu planning practices (Phase 3).
2. To evaluate the nutritional adequacy of regular non-therapeutic menus by comparing them to Canada's Food Guide to Healthy Eating and examining the nutrient content (Phase 1).
3. To determine the most appropriate dietary assessment method for measuring actual dietary intakes of individuals in institutionalized care (Phase 4).
4. To determine if elderly residents on regular non-therapeutic diets consume an adequate supply of macronutrients, vitamins, minerals, and dietary fibre (Phase 4).
5. To assess elderly residents satisfaction with the meals and food services they receive (Phase 2).
6. To assess elderly residents satisfaction with quality life issues as it relates to food choice and food services (Phase 2).
7. To understand the interactions that influence food consumption in a LTC food service system.

1.4 Summary

The Assessment of Food Service Delivery to Elderly Residents in Long Term Care Facilities was a multidimensional study that examined menu analysis, nutritional intake, food service delivery, quality of life issues related to eating, and food service satisfaction of elderly residents in LTC facilities. The study's objectives were tested in four phases, each phase designed to contribute to the understanding that a dynamic

relationship exists within a food service system and within this system all of its components are interconnected. In order to deliver quality nutritional care and food services to LTC residents, understanding the factors that may be involved in such a system, the interrelationships, and how these components influence the proper functioning of the system is important.

Chapter 2 presents a critical review of literature pertaining to the nutritional care of the elderly in LTC facilities. Some of the topics include: factors affecting food consumption, nutrient concerns, dietary assessment, and food service delivery.

Chapter 3 presents an overview of the methodology used in this research study.

Chapter 4 presents the evaluation of the nutrient composition of regular menus, compares the values to the current nutrient recommendations, determines the daily number of food group servings, and current menu planning practices provided by the LTC facilities (Phases 1 and 3).

Chapter 5 presents an examination of the nutrient content of food consumed by elderly residents on regular, non-therapeutic diets. To gather the usual dietary intakes of a group of elderly residents in LTC facilities, two dietary assessment methods, observation and weighed, were employed (Phase 4).

Chapter 6 presents the assessment of food service satisfaction of elderly residents with regard to meals and food services received in their LTC facilities. Satisfaction with quality of life issues related to eating also was addressed (Phase 2).

Chapter 7 provides an overall discussion of the key findings presented in the research and examines the linkages between the four study phases. A model is used to illustrate this process.

CHAPTER 2

LITERATURE REVIEW

2.1 Demographics of Canada's Aging Population

In Canada, over the next 25 years, the elderly population (65 years and older) is expected to double (Statistics Canada, 1999). By the year 2026, 20% of Canadians will be 65 years of age and older as compared to 12.3% in 1998 (Statistics Canada, 1999). Women make-up over half (57%) of the elderly population (Statistics Canada, 1999). Saskatchewan, the province in which this study was conducted, has the highest percentage of seniors at 14.6% (Statistics Canada, 1999) (Table 2.1), and the highest percentage of seniors in the following age categories: 65-74 (7.4%), 75-84 (5.2%) and >85 (2.0%) as a percentage of the total provincial population. Senior women in Saskatchewan comprise 56.4% of the provincial population aged 65 years and over.

2.2 Elderly in Long Term Care Facilities

In Canada, a variety of common terms are given to institutions providing LTC services to the elderly. Depending on the province, LTC may be referred to as continuing care centres, intermediate care, multilevel care, extended care, private hospitals, nursing homes, personal care homes, special care homes, home for the aged, and chronic care (Alberta Health and Wellness, 1999). All of these LTC facilities provide care on a 24-hour basis. In Saskatchewan, the term "special care home" is used to describe those

Table 2.1. Percentage of individuals 65 years of age and older by province.

Province	Percentage of Total Provincial Population
Alberta	9.9%
British Columbia	12.7%
Manitoba	13.6%
Newfoundland	11.4%
New Brunswick	12.9%
Nova Scotia	13.2%
Ontario	12.4%
Prince Edward Island	13.0%
Quebec	12.4%
Saskatchewan	14.6%
CANADA	12.3%

(Statistics Canada, 1999)

individuals (i.e., children, young, and older adults) residing in LTC facilities. Special care homes in Saskatchewan provide accommodation, 24 hour care, and support services (Alberta Health and Wellness, 1999). Twenty-four hour care includes nursing care, food services, laundry services, medication management, and personal, social, recreational, pastoral services.

2.2.1 Demographics of Elderly Residents

The ability to live independently and free from institutional care decreases with increasing age, therefore, increases in residential service capacity among LTC facilities will be required as the population ages (Moore, Rosenberg, & McGuinness, 1997). In 1996, 6.2% of Canadian seniors lived in LTC facilities. Saskatchewan, at 6.7%, had the fourth highest number of seniors residing in LTC facilities based on the percentage of

elderly in the province (Statistics Canada, 1999). Institutionalized elderly tend to be older (>85 years of age), female (Statistics Canada, 1999) and are chronically ill (Statistics Canada, 1999). In 1996, of all women aged 65 years and over, 7.8%, as compared to 3.9% of men in the same age range resided in LTC facilities (Statistics Canada, 1999).

2.2.2 Health Characteristics of Elderly Residents

Elderly residing in LTC facilities are characterized by having one or more chronic illnesses, and some degree of dependency requiring nursing care (Forbes, Jackson, & Kraus, 1987). In 1995, the National Population Health Survey (NPHS) (Statistics Canada, 1995) was conducted to examine the health status of the Canadian population residing in institutions and in households. The NPHS institutional component surveyed a total of 2444 residents, 65 years of age and older, from 214 LTC centres (i.e., hospitals, nursing homes, and residential facilities for people with disabilities, excluding LTC centres on military bases, in correctional institutions, or on Indian Reserves). The participation rate was 93.6%. According to the NPHS (1995), 95% of seniors living in LTC facilities had a chronic health condition. The most common health conditions exhibited by LTC residents were arthritis or rheumatism (45%), chronic heart conditions (27%), high blood pressure (24%), previous stroke (22%), osteoporosis (19%), chronic digestive problems (14%), diabetes (13%), chronic bronchitis, emphysema or other lung conditions (13%), and partial or complete paralysis (8%).

To treat or reduce the symptoms of medical conditions, the elderly require medications. The NPHS (1995) found that 96% of both men and women had taken one form of medication, 88% took two or more medications, and 38% took five different types of medications within two days of the survey being conducted.

The elderly experience physiologic changes in their sensory functions, especially with their vision and hearing. Twenty-eight percent of the elderly residing in LTC had visual impairment, which prevented them from reading, even with corrective lenses (Statistics Canada, 1995). The prevalence of vision problems increase with age in the elderly (Statistics Canada, 1995). Among the elderly living in LTC, 37% of those 85

years of age and older had vision problems compared to 23% of the elderly aged 75-84, and 15% of those aged 65-74 years. Twenty-six percent of LTC residents over 65 years of age had hearing problems which limited participation in group conversations, even when using a hearing aid. Similarly to visual impairment, hearing problems in the elderly increase with age (Statistics Canada, 1995).

Health conditions may predispose LTC residents to reduced physical activity. Statistics Canada (1995) reported that 80 % of LTC residents had some level of physical activity restriction. As a result of their physical limitations, LTC residents required assistance with personal care activities (bathing, dressing, and eating) (72%), getting in and out of bed (49%), moving within the LTC centre (47%), and/or getting in and out of a chair (46%).

2.3 Factors That Influence Food Consumption of the Institutionalized Elderly

Residents living in LTC facilities require special nutritional care (Powers & Folk, 1992). Institutionalized elderly are at an increased risk for inadequate dietary intakes (Powers & Folk, 1992), protein-energy malnutrition (Morley, 1998), and nutrient-specific deficiencies (Elmstahl, Persson, Andren, & Blabolil, 1997), which can lead to increased morbidity and mortality (Chandra, Imbach, Moore, Skelton, & Woolcott, 1991). There are a multitude of factors that may influence an older adult's dietary intake and hence, nutritional status. The aging process leads to changes in taste and smell perceptions. Medical conditions (i.e., diabetes), medication usage (i.e., drug-nutrient interactions), psychological conditions (i.e., dementia), and social aspects (i.e., bereavement and living arrangements) also play a role (Marcus & Berry, 1998). Furthermore, a combination of these variables can make food intake difficult and the eating experience unenjoyable for the elderly resident.

2.3.1 Physiological Changes

As one ages, physiological changes occur that may influence food consumption

(Marcus & Berry, 1998). The elderly have lower energy requirements as their metabolic rate and activity level decreases and they have a reduction in lean body mass, but their need for other nutrients stays the same or in specific cases increase (e.g., calcium needs increase to reduce risk of osteoporosis associated with loss of bone mineral). Due to the natural aging process, the elderly experience decreased appetite, satiety, taste, and smell thresholds (Marcus & Berry, 1998), thereby altering established food preferences (Rudman & Feller, 1989). Loss of the chemical senses in older adults has been shown to be a contributing factor in decreased nutritional intake (Chandra et al., 1991). Many older adults experience decreased sensitivity to sweet and salty flavours, however, bitter and sour flavors are well detected until 70 years of age (Moeller, 1989). Not all elderly are affected to the same extent, but it is more prevalent for those individuals over 70 (Moeller, 1989).

2.3.2 Medical Conditions

The presence of chronic disease and illness increases with age and may affect nutritional intakes (Marcus & Berry, 1998). Malabsorption problems, dysphagia, oral disease, feeding impairments, physical disabilities, neurological disorders and/or other chronic conditions influence dietary intake (Keller, 1993; Morley, 1997). For example, residents with Parkinson's disease may have diminished taste and smell perceptions and have difficulties with motor function (e.g., hand tremor), hindering them from eating an adequate diet (Marcus & Berry, 1998). Residents with cerebrovascular accidents may have dysphagia and/or difficulties with dexterity (Marcus & Berry, 1998) and require additional time and assistance to eat. There also are a variety of conditions that may affect hand and eye coordination, such as degenerative joints, dementia, neurologic disorders, vision problems, thus impacting on the ability to consume an adequate diet.

2.3.2.1 Drug-Nutrient Interactions

Medications are utilized in the management of chronic diseases and symptom control. However, the more complex the condition(s) the greater the complexity of the

drug regimen (Roe, 1994). The consumption of prescription drugs or over-the-counter medications to treat or minimize the effects of a medical condition may cause side effects (Morley, 1997; Vickery, 1993). Medication use can increase or decrease appetite, alter taste and smell perceptions, diminish overall sensory appreciation of food, cause swallowing difficulties, and change the digestion, absorption, metabolism and excretion of nutrients (Marcus & Berry, 1998; Roe, 1994; Vickery, 1993) depending on the type of drug, the amount prescribed, and the duration of use. An older adult on a continuous drug regimen may require additional energy and/or nutrients to meet his/her nutritional needs. Table 2.2 provides a list of common medical conditions, drugs used to treat those conditions, and their potential nutrition related side effects.

2.3.2.2 Restrictive Diets

Dietary restrictions may be used for symptom management or to reduce the risk of complications associated with diseases, such as diabetes mellitus, gout, hypertension, heart disease, and renal failure, in LTC residents. Dietary restrictions are also used for preventive and/or therapeutic reasons. Therapeutic diets provided in LTC have been associated with decreased food intakes and subsequent protein-energy malnutrition (Morley, 1997, 1998), as they may be inappropriately prescribed. These diets may also be unappetizing due to excessive fat or salt restrictions (Aldrich & Massey, 1999; Goodwin, 1989). A retrospective study conducted by Buckler and colleagues (1994) examined the relationship between dietary restrictions and the nutritional status of 217 nursing home patients (81% female, 19% male) from four chronic care facilities. Medical charts were reviewed for serum albumin, height, current weight, weight six months prior to the study, major diagnoses, and current diets. Serum albumin ranged from 19 g/L to 45 g/L, with 50.2% of residents having levels less than 35 g/L. Of patients that were hypoalbuminemic (<35 g/L serum albumin), 24.8% were on regular diets and 75.2% were on nutrient-restricted diets. The most common dietary restrictions were sodium (34.9%), energy (18.3%), and cholesterol (1.8%), with some residents on more than one dietary restriction. Over 17% of the patients with low serum albumin were taking dietary

Table 2.2. Common medical conditions, medications, and nutrition related side effects in the elderly.

Medical Condition	Drugs Used	Potential Nutrition Related Side Effects
Alzheimer's Disease and Dementia's	tacrine hydrochloride	Abdominal pain, constipation, diarrhea, indigestion, anorexia, vomiting, or weight loss.
	ergoloid mesylates	Nausea and GI distress.
Cerebrovascular Accident (Stroke)	reserpine	Cramping and diarrhea.
	warfarin	Antagonism of anticoagulant effects by vitamin K.
Coronary Artery Disease	digoxin	Anorexia and nausea; weight loss; low potassium intake; digoxin toxicity.
	Antihyperlipemics	Weight gain, nausea, diarrhea. May require fat-soluble supplementation and increased fibre intake.
Degenerative Joint Disease	acetylsalicylic acid	Chronic ingestion associated with depressed plasma ascorbic acid and folate levels.
	Steroids	Sodium retention, calcium, nitrogen, and potassium depletion; truncal obesity; and hyperglycemia.
	Nonsteroidal anti-inflammatory agents (NSAIDS)	Increase risk of acquiring hypertension.

Continued...

Continued...

Medical Condition	Drugs Used	Potential Nutrition Related Side Effects
Depression	Monoamine oxidase inhibitors	Constipation, weight gain and GI distress. Requires a tyramine-restricted diet.
	Tricyclic antidepressants	Dry mouth, increase in appetite/weight gain, nausea, vomiting, constipation, anorexia or stomatitis.
	lithium carbonate	Weight gain, metallic taste, nausea, vomiting, and diarrhea. Requires a constant sodium intake.
Hypertension	Diuretics	Enhances excretion of sodium, chloride, and water. Reduces excretion of potassium.
Non-Insulin- Dependent Diabetes Mellitus (NIDDM)	metformin HCL	Diarrhea, abdominal pain, and flatulence.

(Adapted from Escott-Stump, 1998)

supplements. A causal relationship between the use of restricted diets and the occurrence of malnutrition in a nursing home population was not determined in this study. However, the researchers recognized that patients with low serum albumin levels were on dietary restrictions compared to patients with normal serum albumin levels. Coulston, Mandelbaum & Reavan (1990) and Morley & Kraenzle (1994) also have reported that

therapeutic diets, which decrease the palatability of food or restrict calories, also may contribute to inadequate dietary intakes in LTC residents.

2.3.3 Psychological Problems

Elderly residents with psychological conditions such as depression, anorexia nervosa, paranoia, and dementia are at a greater risk of having inadequate nutritional intakes (Marcus & Berry, 1998; Morley, 1998). Depression is the most common cause of weight loss in nursing home residents (Katz, Beaston-Wimmer, Parmelee, Friedman, & Lawton, 1994; Morley & Kraenzle, 1994) and is found more often in older subjects than in younger subjects (Blazer, Bachar, & Hughes, 1987; Fitten, Morley, Gross, Petry, & Cole, 1989). A disinterest in eating or weight loss may be an indication of depression (Henderson, 1988; Morley, 1998). Depression among LTC residents may be caused by bereavement, loss of independence, loneliness, and failing health (The American Dietetic Association, 1998). All of these factors may contribute to a resident's lack of concern for their nutritional needs and food preferences, leading to a decrease in their dietary intake (The American Dietetic Association, 1998). Reduced appetite is common among depressed elderly living in LTC as food loses its symbolism of being warm, caring, and accepting (Kerstetter, Holthausen, & Fitz, 1992).

Late-life recurrence of anorexia nervosa and late-life paranoia are causes of inadequate dietary intakes leading to weight loss (Morley, 1998). Residents may develop anorexia tardive, which is defined as the first occurrence of food refusal in later life related to the desire to maintain a thin body image (Miller, Morley, Rubenstein, & Pietruszka, 1991). In this situation, residents may exhibit oral control patterns such as avoiding eating when hungry (Miller et al., 1991). Residents with late-life paranoia may refuse food because they are afraid of being poisoned (Morley, 1997). In some cases, residents do not eat as a way of manipulating staff to gain attention (Morley & Silver, 1995).

According to the Canadian Study of Health and Aging (1994), 56.9% of Canadians aged 65 and over residing in LTC facilities have some form of dementia.

Residents with dementia, exhibiting agitation and wandering, are prone to lose weight because their energy expenditures are often greater than their energy intakes (Morley, 1998). In dementia, reduced food intake may result from memory loss, disorientation, indifference to certain foods (Henderson, 1988), and a decreased ability to swallow (Morley, 1998). Morley (1998) found that residents with dementia may take up to 60 minutes to feed at a meal and may require cueing to swallow each food item, which places them at an increased risk for inadequate dietary intakes.

2.3.4 Personal Beliefs, Values, and Food Experiences

Food choice and dietary consumption in LTC facilities are influenced by past experiences with food and eating, which are formed by one's values and beliefs (Briley, 1994; Parraga, 1990; Khan, 1998). Attitudes surrounding food behaviour and eating are formed through life experiences with food. LTC residents are a heterogeneous group and come from a variety of social and cultural backgrounds, thus having a diverse set of food values, beliefs, and experiences which may influence their eating behaviour.

2.3.5 Social Factors

Social situations experienced by residents may affect their nutrient intakes (Marcus & Berry, 1998). McIntosh, Shifflett and Picou (1989) found that being married is associated with good nutritional health, and when a spouse dies significant changes in the surviving partner such as a poor self-concept, loss of social networks, and changes in eating patterns may result (Shifflett & McIntosh, 1986). In LTC facilities, the prevalence of widowhood and decreased social networks often is associated with poor mealtime enjoyment, decreased appetite, and weight loss (Rosenbloom & Whittington, 1993). This contrasts with community-dwelling elderly, where strong social networks and friendships are positively associated with improved appetite and nutrient intake (McIntosh et al., 1989).

2.3.6 Environmental Factors

The environment is a critical component in nutrition delivery as socialization and eating are important to the older adult population (Weinstein, 1981). Institutionalization causes residents to feel a loss of identity and control over their care, and a sense of isolation, which may lead to decreased intakes (Morley & Silver, 1995). Kane et al. (1997) found that 58% of residents in a LTC facility found choice and control over their food important.

Mealtimes in LTC facilities differ greatly from that of a private home setting (Sidenvall, Fjellstrom, & Ek, 1994). Eating becomes a social activity (McIntosh et al., 1989) and enjoyment of the activity is related to the company present at mealtimes. In LTC, meals are served in a common dining area, and residents may be seated in groups of two to four or more, with a total of over 25 residents in one location. Residents may find it challenging to share their dining space with cognitively impaired residents and with individuals displaying various clinical conditions. For example, physical disabilities may impair residents from eating in a coordinated fashion (Morley & Silver, 1995), which may affect the food intake of other residents due to inappropriate eating behaviours and unappetizing hygiene. An insufficient amount of qualified employees to assist with the feeding of residents with physical disabilities may contribute to their reduced food intake (Goodwin, 1989; Morley & Silver, 1995).

2.4 Recommended Nutrient Intakes for the Elderly

2.4.1 Canadian Recommended Nutrient Intakes

The Canadian Nutrition Recommendations and the Recommended Nutrient Intakes (RNIs) are guidelines used to prevent nutrient deficiencies, while minimizing the risk of developing chronic diseases based on age and gender specific categories (Health and Welfare Canada, 1990). The Nutrition Recommendations are intended to meet the needs of all healthy individuals over the age of two (to promote healthy diets) and to minimize the risk of developing chronic disease. The RNIs are considered the

recommended amounts of essential nutrients required by the body (which apply to the entire healthy population). They are used to assess and plan diets for individuals and groups, estimate the nutrient needs of the population, and to determine the need for public health intervention programs. Individual diets that do not meet the RNIs are not considered deficient or inadequate, however, the more the diet falls below the RNI the greater the probability that the diet does not provide a sufficient amount of energy, vitamins, and minerals to meet individual nutritional needs (Health and Welfare Canada, 1990).

Nutrition is essential for health maintenance, thus the RNIs may not be appropriate for the elderly population in LTC facilities. Due to a lack of scientific evidence, the RNIs for the elderly are extrapolations of nutrient requirements for younger adults (Ferland, 1995). This is a concern as the elderly have different nutritional needs compared to younger adults due to physiological changes inherent to the aging process. The RNIs are intended for healthy individuals and this excludes special nutritional needs such as metabolic disorders, chronic diseases, injuries, medical conditions, and drug therapies (Lee & Nieman, 1996) commonly seen in the elderly. The RNIs do not take into account nutrient-nutrient and drug-nutrient interactions that might occur due to medication use. Since the elderly are generally not free from illness, the RNIs are not appropriate. Age categories in which the recommended nutrient intakes are based are too wide. The RNIs for the elderly are divided into two age categories; 50-74 years and 75 years+. As the population ages, the fastest growing segment of older adults is seen at older ages. Currently, one in 10 Canadian seniors is 85 years and older compared to one in 20 earlier this century (Statistics Canada, 1999). Therefore, these two age categories may not accurately reflect the nutrient needs of elderly individuals in older age groups. The RNIs for male and female adults aged 50-74 years and 75 years of age and older are presented in Table 2.3. The RNIs do not address the heterogenous nature of the elderly. Older adults come from various backgrounds with differing social, cultural, economic, and physiologic needs. Nutritional requirements of the elderly may also be affected by previously suboptimal food intakes (Klein & Rogers, 1990). RNIs are based on

chronologic age. Since the elderly are living longer (Statistics Canada, 1999) and many are functionally well until advanced ages (Chandra et al., 1991), physiologic age may be more important in determining nutritional requirements (Klein & Rogers, 1990). For example, one 80 year old may be running marathons, whereas another may be hospitalized with Alzheimer's Disease.

2.4.2 Dietary Reference Intakes

Dietary Reference Intakes (DRIs) were established by the Food and Nutrition Board of the Institute of Medicine, National Academy of Sciences for the purpose of providing nutrient-based recommendations for healthy individuals in North America (Canada and the United States) (Institute of Medicine, 1997). The DRIs collectively consist of four nutrient-based dietary reference values: estimated average requirement (EAR); recommended dietary allowance (RDA); adequate intake (AI); and tolerable upper intake level (UL), for every life-stage and gender group (Table 2.4). The nutrient requirements created under the DRIs will replace the 1989 U.S. Recommended Dietary Allowances (RDAs) (National Research Council, 1989) and the 1990 Canadian Recommended Nutrient Intakes (RNIs) (Health and Welfare Canada, 1990), however, the term RDA will continue to apply. The combining of the two nutrient recommendations is necessary as a means of introducing consistency among nutrient guidelines in Canada and the United States. Also, research in the understanding of nutrient requirements for individuals and groups, food constituents, and diet/disease relationships have progressed since the last nutrient revisions of the RDAs and the RNIs.

In 1995, the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes (DRI Committee), consisting of nutrition experts from Canada and the United States, created seven expert related nutrient group panels: 1) Ca, Vitamin D, Phosphorus, Mg, F; 2) Folate, B₁₂, B Vitamins and Choline; 3) Vitamins C and E, Se, β -carotene and Other Carotenoids; 4) Vitamins A and K, B, Cr, Cu, Fe, I₂, Mn, Mo, Ni,

Table 2.3. Recommended nutrient intakes of persons 50-74 years and 75 years of age and older.

Nutrient	Recommended Nutrient Intakes			
	50-74 Males	50-74 Females	75 + Males	75 + Females
Energy (kcal)	2300	1800	2000	1700
Protein (g)	63	54	59	55
Vitamin A (RE)	1000	800	1000	800
Vitamin D (μ g)	5	5	5	5
Vitamin E (mg)	7	6	6	5
Vitamin C (mg)	40	30	40	30
Thiamin (mg)	0.9	0.8	0.8	0.8
Riboflavin (mg)	1.2	1.0	1.0	1.0
Niacin (mg)	16	14	14	14
Vitamin B ₆ (mg)	0.95	0.81	0.89	0.83
Vitamin B ₁₂ (μ g)	1.0	1.0	1.0	1.0
Folate (μ g)	230	195	215	200
Calcium (mg)	800	800	800	800
Phosphorus (mg)	1000	850	1000	850
Magnesium (mg)	250	210	230	210
Iron (mg)	9	8	9	8
Iodine (μ g)	160	160	160	160
Zinc (mg)	12	9	12	9

(Health and Welfare Canada, 1990)

Table 2.4. Dietary reference intake categories.

DRI Category	Definition
Estimated Average Requirement (EAR)	The nutrient intake value that meets the requirement of 50% of healthy individuals in a group.
Recommended Dietary Allowance (RDA)	The average daily intake requirement that meets the nutrient needs of 97-98% of healthy individuals in a group; calculated from the EAR.
Adequate Intake (AI)	A recommended daily intake based on observed or experimentally determined approximations of nutrient intakes by a group of healthy individuals. Used only when RDAs are not available.
Tolerable Upper Intake Level (UL)	The highest level of nutrient intake that is likely not to cause any adverse health affects in almost all healthy individuals. The risk of adverse affects increase with intakes above the UL.

(Institute of Medicine, 1997)

Si, V, Zn; 5) Energy and Macronutrients; 6) Electrolytes; and 7) Other Food Components, and two subcommittees: 1) Upper Reference Levels; and 2) Uses of DRIs (Institute of Medicine, 1997).

When examining the appropriateness of the DRIs for elderly in LTC facilities, there are some concerns, which are similar to those addressed for the RNIs. The DRIs are designed for healthy individuals, whereas the elderly in LTC facilities are known to have chronic diseases, medical conditions, and/or are on drug regimens. Nutrients with specific EARs are based on scientific research on nutrient requirements in the elderly, however, these requirements are intended for the prevention of disease rather than the treatment of disease. As the elderly in LTC may not be free from illness, specific

recommendations for the treatment of disease are essential for this population. The DRIs are divided into two age categories; 51-70 years and 70 years+ which continue to be too wide to meet the nutritional needs of the elderly in the older age group, 70 years+. For example, an older adult that is 75 years old does not have the same nutritional requirements as an individual who is 100 years old.

2.4.2.1 Assessing Groups

In order to assess the nutritional adequacy of dietary intakes and to plan diets for individuals or groups, nutrients must have a specific EAR. EAR is the amount of nutrient estimated to meet the needs of half the healthy individuals in a specific life-stage and gender group. The EAR cut-point method is used to evaluate the prevalency of inadequacy of the dietary intakes of a group of individuals (Beaton, 1994; Institute of Medicine, 2000b). This method examines the proportion of individuals in a group with dietary intakes that are below the median nutrient requirement (EAR). Before an EAR can be set, criteria of adequacy for each nutrient is determined based on a critical review of literature. The criteria selected is based on the amount of nutrient necessary to reduce disease risk, evidence-based research and other health parameters (Yates, Schlicker, & Suitor, 1998). Table 2.5 provides the nutrients with an EAR. At this time, there are specific guidelines for the nutrient assessment of groups, but not for the planning of diets (Institute of Medicine, 2000b).

AIs are provided for nutrients when sufficient scientific evidence is not available to calculate EARs (and therefore RDAs). AIs are based on observed or experimentally determined estimates of nutrient intakes by groups of healthy individuals. However, AIs cannot be used to plan and assess diets for groups. Nutrients that have AIs are displayed in Table 2.6.

2.4.3 Canada's Food Guide to Healthy Eating

Canada's Food Guide to Healthy Eating (Health and Welfare Canada, 1992) provides Canadians, four years of age and older, with nutrition guidelines to assist them

in planning nutritionally balanced meals and evaluating their diets. Canada's Food Guide relates to the information provided in the 1990 Canadian Nutrition Recommendations (Health and Welfare Canada, 1990). The Food Guide consists of 4 major food groups; grain products, vegetables & fruit, milk products, and meat & alternatives, shaped as a rainbow to emphasize that the foods located on the outer layers of the rainbow should predominate in the diet. A range of serving sizes are given for each food group to account for an individual's age, sex, body size, activity level, and for pregnant or breastfeeding women such as: grain products (5-12); vegetables & fruit (5-10); milk products (children (4-9 y), 2-3; youth (10-16 y), 3-4; adults, 2-4; pregnant/breast-feeding women, 3-4); and meat & alternatives (2-3). The amounts that are counted as one serving are provided. The Food Guide discusses the importance of selecting a variety of foods from each food group, maintaining a healthy body weight, and choosing foods that contain a lower amount of fat, salt, alcohol, and caffeine. These guidelines are used to encourage Canadians to maintain a healthy lifestyle.

2.5 Nutrient Concerns in Elderly Residing in Long Term Care Facilities

Malnutrition is the most common nutrition problem in residents living in LTC facilities (Morley & Silver, 1995). Reported estimates on the prevalence of protein-energy malnutrition in nursing homes range from 5 % to 85% (Kerstetter et al., 1992; Morley, 1998; Morley & Silver, 1995; Whitehead & Finucane, 1997). This large variation can be attributed to the use of diagnostic criteria and assessment methods that are not standardized in identifying malnutrition (Kerstetter et al., 1992; Whitehead & Finucane, 1997). Protein-energy malnutrition is associated with the following: nutritional deficiencies; delayed wound healing; increased susceptibility to infections; poor nutritional status; cognitive problems; anemia; increased morbidity and mortality; and respiratory, musculoskeletal, and cardiac difficulties (Kerstetter et al., 1992; Whitehead & Finucane, 1997). In a study conducted by Elmstahl et al. (1997), 84% of the 61 residents (70% female, 30% male; mean age, 86.8 ± 7.8 years) in the long-stay

Table 2.5. Dietary reference intakes for nutrients with RDAs of persons 51-70 years and 70 years of age and older per day.

Nutrient	Recommended Dietary Allowance			
	51-70 Males	51-70 Females	70 + Males	70 + Females
Thiamin (mg)	1.2	1.1	1.2	1.1
Riboflavin (mg)	1.3	1.1	1.3	1.1
Niacin (mg)	16	14	16	14
Vitamin B ₆ (mg)	1.7	1.5	1.7	1.5
Vitamin B ₁₂ (μg)	2.4	2.4	2.4	2.4
Folate (μg)	400	400	400	400
Magnesium (mg)	420	320	420	320
Phosphorus (mg)	700	700	700	700
Vitamin C (mg)	90	75	90	75
α-Tocopherol (mg)	15	15	15	15
Selenium (μg)	55	55	55	55
Vitamin A (μg)	900	700	900	700
Copper (μg)	900	900	900	900
Iodine (μg)	150	150	150	150
Iron (mg)	8	8	8	8
Molybdenum (μg)	45	45	45	45
Zinc (mg)	11	8	11	8

(Institute of Medicine, 1997; 1998; 2000a)

Table 2.6. Dietary reference intakes for nutrients with AIs of persons 51-70 years and 70 years of age and older per day.

Nutrient	Adequate Intake			
	51-70 Males	51-70 Females	70 + Males	70 + Females
Calcium (mg)	1200	1200	1200	1200
Vitamin D (μg)	10	10	15	15
Fluoride (mg)	4	3	4	3
Pantothenic Acid (mg)	5	5	5	5
Biotin (μg)	30	30	30	30
Choline (mg)	550	425	550	425
Vitamin K (μg)	120	90	120	90
Chromium (μg)	30	20	30	20
Manganese (mg)	2.3	1.8	2.3	1.8

(Institute of Medicine, 1997; 1998; 2000a)

geriatric unit had energy intakes below estimated energy expenditure, and 35% of women and 17% of men had an energy intake below the estimated basal metabolic rate (BMR). Geriatric patients had dietary intakes far below recommendations in energy, vitamin B₁₂, vitamin C, vitamin D and iron, which put them at an increased risk of developing nutritional deficiencies, possible medical complications, and protein-calorie malnutrition (Elmstahl et al., 1997). Moores and Groziak (1989) attribute one-third of all medical problems in older adults to nutritional insufficiencies that often go unrecognized as an underlying cause to the problem.

Keller (1993) examined the prevalence of overall malnutrition among institutionalized elderly and the factors associated with these conditions. Malnutrition was defined as: 1) undernutrition as a result of insufficient food intake or inability to

digest, assimilate, and utilize nutrients; 2) overnutrition as a result of excess food intake or medication use; 3) specific nutrient deficiencies, and 4) imbalance because of disproportionate intake (Keller, 1993). Two hundred elderly subjects (17% female, 83% male; mean age, 78.5 years) were surveyed for nutritional status, feeding behavior, dietary intake, and medical status. Subjects were classified into four categories of malnutrition: mild/moderate undernutrition, severe undernutrition, mild/moderate overnutrition, and severe overnutrition. Twenty-eight percent of subjects had mild/moderate undernutrition, 18% had severe undernutrition, 18% had mild/moderate overnutrition, and 10% had severe overnutrition. Undernutrition was positively associated with age, presence of a feeding tube, poor appetite, poor protein intake, slow eating, and dysphagia. Overnutrition was positively associated with primary diagnosis and number of medications taken. The results of this study show that medical conditions known to affect nutrient intake need to be considered in a resident's nutritional care plan.

2.5.1 Macronutrients

The macronutrients of concern in the elderly are energy, protein, and dietary fibre. Protein malnutrition is becoming increasingly prevalent in the institutionalized elderly population, which can severely affect quality of life (Pinchcofsky-Devin & Kaminski, 1987). Energy intake in LTC residents has been shown to be inadequate (Lipski, Torrance, Kelly, & James, 1993; Lowik et al., 1992; Nguyen, Flint, Prinsley, & Wahlqvist, 1985; Rudman, Abbasi, Isaacson, & Karpik, 1995; Sahyoun et al., 1988). Lowik et al. (1992) suggests that the reduction in food energy intake by the elderly results from decreased energy expenditure due to lower basal metabolic rates and less participation in physical activity. Residents in nursing homes participate in small amounts of light physical activity, if any, depending on their medical condition and nutritional status. When examining research studies, researchers often compare energy to the RDA values, which assumes light-to-moderate activity (Johnson, Smiciklas-Wright, Soucy, & Rizzo, 1995; Sahyoun et al., 1988). Therefore, energy intakes appear to fall below the RDA. In a Canadian study examining fibre and nutrient intakes (McCargar, Hotson, &

Nozza, 1995), the researchers adjusted the RNIs for energy by 200 kcal less daily to reflect the decrease in activity participation seen in the elderly and that these RNI values are based on moderate activity. It was shown that the subjects (female, n=29) mean energy intake was 107% of the RNI.

There is conflicting evidence in the literature whether or not the current recommended protein intakes for the elderly are adequate. Some researchers suggest that the current RDA of 0.8 g protein/kg is adequate, while others say that this recommendation is inadequate to maintain nitrogen balance (Campbell, Crim, Dallal, Young, & Evans, 1994; Gersovitz, Motil, Munro, & et al, 1982). Adequate protein intake by the elderly is needed to help decrease the high prevalence of chronic conditions such as infections, bronchitis, and leg ulcers (Steen, 1981), and to promote healing. Dietary intakes conducted in nursing homes show that the elderly are consuming sufficient amounts of protein when compared to the RNIs (M: 50-74y, 63g; 75+y, 59g; F: 50-74y, 54g; 75+y, 55g) and RDA (M/F: 51+y, 0.8 g/kg) (Lasheras, Gonzalez, Garcia, Patterson, & Fernandez, 1999; Lipski et al., 1993; Lowik et al., 1992; McCargar et al., 1995; Sahyoun et al., 1988), even though their energy intakes are low (Lowik et al., 1992; Sahyoun et al., 1988). However, Fiatarone et al. (1994) found that protein requirements are affected by immobility, thus causing negative nitrogen balance. Therefore, LTC residents who are bedridden, wheel-chair bound or have limited mobility may require higher levels of dietary protein.

Inadequate dietary fibre intake in the elderly residing in LTC facilities has been reported (Lasheras et al., 1999; Lipski et al., 1993; McCargar et al., 1995; Nguyen et al., 1985). Dietary fibre has been shown to improve glucose tolerance, reduce incidence of constipation, prevent colon cancer, and lower serum lipids (Chernoff, 1995). Constipation is a common problem in the elderly population. Compacted bowels can occur when dietary fibre intake is not high enough. Increasing the fibre and water intake of older adults can prevent and treat problems associated with bowel dysmotility (McCargar et al., 1995). In LTC facilities, low intakes of fibre may be associated with high levels of laxative use which lead to further nutritional and medical concerns.

Laxatives, stool softeners, and enemas are extensively prescribed to elderly residents in LTC facilities. McCargar et al. (1995) examined fibre intakes of 32 chronic care elderly residents living in two acute care facilities and found that their fibre intakes were low (females, 13 ± 0.8 g/day; males, 17.3 ± 1.8 mg/day). Currently, there are no recommendations for dietary fibre in Canada. According to the World Health Organization (1990), dietary fibre intake should be between 27 - 40 g/day.

2.5.2 Vitamins

The vitamins of concern in the elderly are vitamin D, vitamin B₆, vitamin B₁₂, and folate. Vitamin D is essential for the development and maintenance of bones and for the efficient utilization of dietary calcium. It also maintains serum calcium and phosphorus levels, which support bone mineralization, neuromuscular function, and other cellular processes. Insufficient vitamin D intake in adults may result in a metabolic bone condition known as osteomalacia. This condition is caused by a mineralization defect of the osteoid (i.e., the organic matrix of bone) that affects adults, mainly the elderly and causes the bones to soften (Holick, 1996). Vitamin D deficiency not only causes osteomalacia, but exacerbates osteoporosis. Osteoporosis is the loss of bone matrix and bone mineral due to the deficiency of calcium, vitamin D or both.

Vitamin D deficiency in the institutionalized elderly population is a growing concern as age-related changes in the skin, renal function, gut absorption, and sunlight exposure affect the formation of vitamin D metabolites (Gloth III & Tobin, 1995; Liu et al., 1997). The efficiency of skin to convert 7-dehydrocholesterol to cholecalciferol (vitamin D₃) is decreased. The production of the enzyme 1-alpha-hydroxylase is also reduced and its activity in the kidney decreases with increasing age. The decrease in the production of 1-alpha-hydroxylase suggests that there is less 1,25-dihydroxyvitamin D, the active form, being produced. As a person ages, the gastrointestinal tract is less able to absorb vitamin D to levels as high as a 40% decrease in absorptive ability (Gloth III, Sherman, & Hollis, 1991). Medication use (i.e., anticonvulsants) may also interfere with the metabolism of vitamin D, therefore decreasing vitamin D status. In a study by Gloth

III et al. (1991), the vitamin D status of nursing home and hospital patients over the age of 65 years was measured and found to be lower than an elderly control group. The level of 1, 25-dihydroxyvitamin D in the control group was significantly higher than the sunlight-deprived patient group. Gloth III et al. (1991) suggest that this was due to decreased substrate or inadequate conversion at the kidney primarily due to differences in sun exposure in the two groups.

Vitamin B₆, Vitamin B₁₂, and folate are of increasing concern in the institutionalized elderly because not only are dietary intakes low among this population, but absorption can be compromised (Rolfes, DeBruyne, & Whitney, 1998). A lack of these vitamins can compromise the immune system, which already has declined as a result of the aging process (Chandra, 1997). Also, deficiencies lead to rises in plasma homocysteine levels, a risk factor for heart disease and stroke (Rolfes et al., 1998).

2.5.3 Minerals

The minerals identified as a concern in the elderly are calcium and zinc. Wood, Suter and Russell (1995) report that the proportion of elderly people ingesting less than 2/3 of the 1989 RDA for calcium (800 mg/day) is about 19-40% in males and 35-43% in females. The deficiency in calcium in the elderly population is not only due to decreased intake, but also a decrease in intestinal absorption (Gamez et al., 1997). Gamez et al. (1997) state that calcium deficiency is related to poor vitamin D status, and disorders that affect intestinal absorption and renal reabsorption, which are common in aging. Calcium deficiency is associated with an increase in the prevalence of fractures, osteoporosis and bone loss.

Zinc intake has been shown to be inadequate in the institutionalized elderly (Gloth III, Tobin, Smith, & Meyer, 1996; Johnson et al., 1995; Nguyen et al., 1985; Rudman et al., 1995; Sahyoun et al., 1988). Zinc is necessary for wound healing, taste acuity, and cell-mediated immunity.

2.6 Food and Nutrition Standards and Accreditation Procedures in Long Term Care Facilities

2.6.1 Canada

A voluntary accreditation program, offered by the Canadian Council on Health Services Accreditation (CCHSA, a nonprofit, non-government group) examines the quality of care and services delivered to residents of health care and service organizations in all of the Canadian provinces. The benefits of accreditation for a healthcare organization include: increased credibility; independent and valuable advice from peers; and improved public and client recognition. In addition, CCHSA offers ways in which organizations can continuously improve their services (Canadian Council on Health Services Accreditation, 1995). The program is client-centred and is based on quality improvement with emphasis on: residents and their families experiencing care; the roles, responsibilities, and competencies of employees as caregivers and team players; the infrastructure and support services that deliver quality resident care; and the improvements in the quality of care and services provided (Canadian Council on Health Services Accreditation, 1995). The accreditation program involves an external peer review by senior health care professionals and an internal self-assessment, enabling organizations to assess their performance against a set of nationally applied standards. The accreditation standards allow organizations to monitor and improve their performance on a regular basis. Mandatory accreditation procedures do not exist for LTC facilities in Canada to ensure the nutritional needs of elderly residents are being met. The support services section includes a brief section on food services (i.e., food handling, preparation, transportation, and distribution), however, nutritional care and delivery are not emphasized in this process.

2.6.2 Health Care Structure in Saskatchewan

In 1992, health reform was introduced in Saskatchewan for the purposes of providing effective health care services and improving the quality of life of all

Saskatchewan residents. The objectives were to be accomplished by redistributing resources, and by regionalization and reorganization of the health care structure. Thirty-two health districts and one northern health authority (i.e., First Nations Community located in Northern Saskatchewan) were established in the province. Each district and authority is governed by one board composed of elected and appointed members and is responsible for planning, managing, and delivering health services to residents in their region.

Prior to health care reform, Saskatchewan Health (i.e., Government of Saskatchewan Department for Health Services) made available to LTC facilities both a consultant dietitian and a continuing care consultant to help organize, monitor, implement, and evaluate procedures relating to food service delivery and nutrition. With health care reform, the accountability for food and nutrition services in the province shifted to the health districts. At present, LTC facilities are not required to have a dietitian or a nutrition professional either on staff or as a consultant to manage, provide advice, and monitor the nutritional care of residents. Furthermore, the existing guidelines (Saskatchewan Health, 1990), developed prior to health reform, are neither comprehensive nor current. The guidelines contain a previous version of Canada's Food Guide, and dated nutritional and food service delivery information.

2.6.2.1 Provincial Food Service Delivery and Nutrition Regulations

Currently, no provincial regulations specific to food service delivery, nutritional care or dietitian time/services in LTC facilities exist in Saskatchewan compared to other Canadian provinces (Barker, 1998). Since health care is a provincial matter, legislation and standards may vary from province to province. Barker (1998) surveyed dietitians employed by LTC facilities in 10 Canadian provinces; British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland. The topics that were addressed were provincial LTC legislation, regulations and/or standards in relation to dietary/nutrition services, how LTC food and nutrition services are funded, and current LTC trends. There is considerable

diversity in food and nutrition services provided by LTC facilities in each province. Manitoba and Newfoundland do not have legislation specific to LTC facilities. Alberta, New Brunswick, and Nova Scotia are the only provinces that made reference to dietitians and/or nutritional care for residents in their LTC legislation. The legislation in Saskatchewan is based on the document, “The Act Respecting Housing and Special Care Homes and Related Matters”, where dietitian consultations and/or nutritional care for LTC residents is not addressed. Regulations (i.e., laws made under authority of a statute) specifically for LTC facilities do not exist in Manitoba, Nova Scotia, and Saskatchewan. Of the provinces with regulations only British Columbia, New Brunswick, Ontario, and Prince Edward Island provide standards for food services, dietitian services and/or nutrition care for their residents. Standards (i.e., criteria) for food services, nutritional care, and dietitian time/services do not exist in Newfoundland, Quebec, and Saskatchewan. At the time the survey was conducted, the standards used by provinces were developed prior to 1995.

Presently, there are no Canadian standards for nutrition and food services provided in LTC facilities. The Ontario LTC Action Group of Dietitians of Canada (1999) has developed nutrition care, food production and service, and departmental standards for LTC facilities in the form of a working paper, however, the document lacks specific tools and indicators required to measure performance against developed standards.

2.6.2.2 Saskatoon District Health

Saskatoon District Health was established in 1992 as a result of regionalization initiated by health care reform. It is the largest and the most complex of the 32 community-managed health districts in Saskatchewan. Saskatoon District Health is a fully-integrated health service network providing one hundred and fifty services and programs to 242,000 District residents (Saskatoon District Health, 2001). Health services in SDH is governed by an eight-person elected and six-person appointed board. SDH encompasses approximately 50+ rural and urban communities and occupies a 65

kilometre radius from the City of Saskatoon. The District is responsible for health services provided to 17 LTC facilities, of which 14 are urban and 3 are rural, and 3 acute care hospitals.

Long term care facilities provide care for individuals who require needs beyond those available through community and home-based approaches. They are publicly subsidized and licensed under *The Housing and Special Care Homes Act* (Saskatchewan Health, 1980) and provide care to more than 1,600 people (i.e., children, adults and the elderly). Individuals requiring LTC placement are examined by the Coordinated Assessment Unit (CAU). The CAU uses a single-entry assessment system (assessment from one portal instead of many portals) to access a client for permanent admission to a LTC facility or respite care (i.e., provides relief for the caregiver or a recovery period for the client) within Saskatoon District Health. Client eligibility for admission is determined by the CAU and each client is placed on a priority list. Together with the LTC facilities, the CAU ensures that clients with the most critical needs are admitted to the appropriate LTC facilities in a timely manner.

2.6.2.2.1 Standards for Quality of Life in Saskatoon District Health

Quality of life has become a critically important concept in health care in recent years (Mitchell & Kemp, 2000). Quality of life refers to the assessment of subjective importance and perceived availability of autonomy, interpersonal relations, and security in a LTC environment. Quality of life must be considered in the overall care of individuals residing in LTC facilities to ensure that residents' are provided with the best possible care in the least restrictive manner in a home-like environment (Mitchell & Kemp, 2000). Saskatoon District Health implemented quality of life standards for their LTC facilities in January 1996. These standards can be found in the document, *Standards For Quality of Life, Long Term Care Division* (Saskatoon District Health, 1996). The document addresses the residents' need and right to receive competent care in a safe environment, and to exercise personal choice in their care plans, including the right to make informed choices that may put them at risk. The residents' ability to exercise choice in a LTC

setting is important as some control over personal care and routines are lost once admitted into a LTC facility. The ability to control some aspect of their lives is a critical determinant of their perceived quality of life (Forbes, Jackson & Kraus, 1987).

2.7 Food and Nutrition Services in Long Term Care Facilities

A variety of food service systems exist in LTC facilities, which may influence resident food service satisfaction, and the quality of nutritional care provided to residents. Each facility has their own specific food production technology, meal distribution system, and menu cycle. The health care environment is changing with a focus on cost control and quality service in areas such as staffing, food procurement, food production, and food service delivery. Food service operations are changing to accommodate the needs of their residents, their facilities, and budgetary cutbacks.

Food production technology currently used by LTC facilities include one of the following: conventional (all food preparation completed on site, traditionally used in institutional settings); commissary (centralized food procurement and production, food delivered to satellite centres); ready prepared (menu items are produced and held chilled or frozen until served); and assembly/serve (ready prepared foods or foods with minimal cooking are brought into the facility for assembly) (Spears, 2000). Lengyel and colleagues (2000) recently completed a study examining food service operations in LTC facilities in SDH. A 30-item self-administered questionnaire was developed requesting information about food service practices from all 18 LTC facilities in SDH, of which 13 questionnaires were completed and returned (72% completion rate). Twelve of the 13 facilities prepared foods using a conventional system, whereas one facility used a ready prepared or otherwise known as a cook-chill system.

The techniques used to deliver meals in hospital or LTC settings vary. Meal distribution systems include: traditional food service (a food service employee delivers meals directly to patients); traditional nursing service (a nursing service employee delivers meals directly to patients); nontraditional food service (host program where a food

service employee, specifically trained in meal-service procedures, provides wait-type food service directly to patients); and a nontraditional nursing meal service (patient-focused program where multi skilled employees provide a wide range of patient-care services including meals) (Lambert, Boudreaux, Conklin, & Yadrick, 1999). The latter two delivery systems are recent innovations to meal service delivery to improve patients' meal experiences by creating a 'home-like' environment. Meals in the study by Lengyel et al. (2000) were distributed by cooks, dietary aides, nursing staff, and LTC aides/resident attendants/nursing aides, with some LTC facilities having participation from various departments such as recreation, physical therapy, and administration.

In the late 1960s and early 1970s, cycle menus evolved in LTC facilities to maximize planning time, food variety, and control over food purchasing, production, and cost (Stinson, 1988). Within each food service system, cyclic menus offer different food items daily on a weekly, biweekly or another basis set by the LTC centre. The cycle menu can either be selective (i.e., offering food choices of all or some menu items) or nonselective (i.e., no food choices offered). As described by Lengyel et al. (2000), menu cycles were used by 13 of the 18 participating SDH LTC facilities. The menu cycles ranged from 4 to 7 weeks in length, with 5 weeks being the most common (39%), followed by 6 weeks (31%), 7 weeks (23%), and 4 weeks (8%). Fifteen types of job classifications were responsible for menu planning. Forty-six percent of the LTC facilities had more than one staff member in charge of menu planning. Ninety-two percent of the facilities belonged to a group purchasing plan such as LTC (Extendicare) (58%), SDH Purchasing Group (42%), and Complete Purchasing (8%). Twenty-five percent of the LTC facilities belonging to a group purchasing plan used the menu cycle provided by that group (Lengyel et al., 2000). To plan menus, LTC facilities obtained input from residents informally (92%), and formally using food satisfaction surveys (77%), resident council meetings (54%), resident's families (31%), and staff (15%). LTC facilities indicated the reasons for changing or revising their menus. The six most common responses were: concerns, requests and likes/dislikes of clients/residents; seasonal changes and availability of food items; special events and holidays; cost and budget; waste audits or observation

of plate waste; and staff and cafeteria customer satisfaction.

2.7.1 Resident Food Service Satisfaction

Customer satisfaction surveys are necessary tools in assessing products and services provided to consumers and for measuring health care (Owens & Batchelor, 1996; Scott & Smith, 1994). Satisfaction surveys have been widely used in hospital settings to monitor patient care (Ehnfors & Smedby, 1993) and less commonly used for assessing food service satisfaction (Dube, Trudeau, & Belanger, 1994). When food service satisfaction surveys are conducted, subjects 65 years of age and older are generally excluded. This occurs because of the general difficulties with collecting information from older respondents and finding a cognitively non-impaired sample (Simmons et al., 1997). Dissatisfaction with food services provided by LTC facilities may influence an individual's dietary intake.

Decreased food intakes among LTC residents may be influenced by the monotony of institutionalized food, the failure of food service staff to recognize cultural and geographic food preferences, and plate presentation (Chambers, 1996; Morley, 1997). Resident satisfaction to the meal delivery system may influence an individual's food intake. Lambert et al. (1999) examined different meal distribution systems on patients', employees', and food service directors' level of satisfaction with food and service quality in hospitals. Four meal distribution systems were examined: (1) traditional food service (food service employees deliver meals directly to patients); (2) traditional nursing service (nursing employees deliver meals directly to patients); (3) nontraditional food service (host program where food service employees trained in meal service procedures waits on patients directly); and nontraditional nursing meal distribution (patient-focused program where hospital employees are cross-trained to provide a wide variety of patient services). Significant differences were found between the patients' rating of the quality of service for meal delivery among the four meal distribution systems. However, hospitals that had the traditional food service distribution system had higher patient ratings of food quality than hospitals with traditional nursing distribution systems. Even though these results

were statistically significant, the effect size was low and the practical implications were weak. There were no significant differences between the patients' rating of food quality in hospitals with the host program and the patient-focused care program compared to hospitals using the traditional meal distribution system. Thus, this study suggests that changing meal delivery systems may not improve patient satisfaction with food services. However, a limitation of this study was the low number of participating hospitals that used the patient-focused distribution system.

2.7.2 Food Service Trends

Future hospital food service trends include serving meals to less inpatients, employing less staff, having smaller expense budgets, and generating more revenue via the food service department (Silverman et al., 2000). LTC has similar trends with the addition of liberalizing diets (i.e., providing less strict diet prescriptions) (Aldrich & Massey, 1999; The American Dietetic Association, 1998), creating a more home-like environment, improving the quality of care and the quality of life of the residents, and increasing residents' roles in making informed care decisions (Fisher, 1995; The American Dietetic Association, 1998). LTC facilities are changing their institutional appearance to one of a more pleasing, comfortable, and home-like atmosphere (Fisher, 1995). New interior finishes and designs are being applied to dining areas to change the cafeteria look into one of an upscale restaurant (Fisher, 1995). Some LTC facilities use tablecloths and cloth napkins at mealtimes. In response to cuts to healthcare budgets and downsizing, LTC facilities are implementing non-select menus, computerized functions, multi-skilled employees (i.e., cross-trained in more than one department), the kitchen-less concept (i.e., prepared food products are rethermalized and assembled on site), and/or outsourcing (i.e., prepared food products are purchased in a ready-to-serve or ready-to-heat form) (Puckett, 1997).

2.8 Nutrient Analysis

Nutrient analysis is necessary for determining the amount and type of nutrients, and food components consumed by individuals or groups for the purpose of assessing diets and planning menus. Successful nutritional analysis of dietary intakes require valid and reliable dietary assessment methods. Also, a computerized diet analysis system needs to be selected based on its nutrient database and functions. The database should be current, accurate, contain a wide variety of food products, and meet the needs of the research.

Prior to the 1960s, researchers manually determined the nutrient content of diets using food composition tables presented in hard copy tables. The introduction of computer programs in the 1960s, allowed for dietary data to be analyzed more efficiently. Presently, the electronic version of the United States Department of Agriculture (USDA) Handbook No.8, Composition of Foods, Raw, Processed, Prepared, the USDA Nutrient Database for Standard Reference, Release 13 is the most extensive and comprehensive food composition table in the world containing over 6,200 foods for up to 82 nutrients and serves as the published standard reference for food composition in the United States (Lee & Nieman, 1996; Selley, 1999). In Canada, the food composition database recommended for Canadian food intake studies is Health Canada's Canadian Nutrient File (CNF) (1997), which contains 4,668 foods with 115 nutrients. The CNF is based on Release 10 of the USDA Nutrient Database for Standard Reference (1996), however, it includes Canadian specific fortification levels and regulatory standards, Canadian only foods, and some brand name foods (Health Canada, 1997; Selley, 1999).

Selecting a nutrient database requires careful examination of a variety of databases. Each database should be assessed on the total number and type of food items contained in order to accurately assess an individual's dietary intake. Foods in the database need to contain sufficient detail for the purpose of identifying real differences between their nutrient compositions (Perloff, 1989) as this is essential when using food substitutions (i.e., selecting similar foods for food items are not available).

In food composition tables, missing data for specific nutrients found in foods also is an issue (Perloff, 1989). Perloff (1989) identifies four categories that help to explain why databases contain incomplete nutrient information: 1) Data on some nutrients may be missing from almost all foods; 2) Nutrient values are likely to be randomly missing throughout the database; 3) Complete nutrient profiles are often missing for new or less popular foods; and 4) Home, restaurant-prepared foods, ethnic foods, and foods unique to different population groups may not be included in the database. In these cases, data for missing nutrients need to be imputed with nutrient values from similar foods. Nonetheless, inaccuracies in imputed data may be another potential source of error. Nutrient analysis requires skilled personnel and resources containing the required information. In regards to USDA's Nutrient Database for Standard Reference, Release 13 (U.S. Department of Agriculture, 1999), USDA annually revises its database by adding food composition data for new items and updating data for selected foods.

A study by Nieman et al. (1992), compared six microcomputer dietary analysis programs; DINE Windows, Food Processor II, Minnesota Nutrition Data System, Nutri-Calc HD, Nutritionist III, and Professional Dietitian. In the study, a 3-day food record with 73 basic food items was entered into each nutrient analysis system. The nutrient data from each of the programs were then compared with hand-calculated values from the USDA NDB full version, release 9, USDA Handbook No. 8. The results of the six programs yielded differences in: cost; number of foods and nutrients included in the database; use of non-USDA data (food industry and scientific literature); imputation of data for values missing; number of print/export features; time required to analyze a 3-day food record; and ease of use. All of the systems were within 7% of the USDA NDB for energy, protein, total fat, and total carbohydrates, however, the proportion of vitamins and minerals varying more than 15% from the USDA NDB differed considerably between the 6 programs. For example, the amount of zinc calculated by the six programs was different than the USDA NDB (10.5 mg): DINE Windows (nutrient not analyzed); Food Processor II (10.3 mg); Minnesota Nutrition Data System (10.7 mg); Nutri-Calc HD (8.67 mg); Nutritionist III (10.3 mg); and Professional Dietitian (8.20 mg). Thus, it is

important to recognize that different dietary analysis programs may give different nutrient intake values using the same foods.

When estimating the nutrient content of diets, care must be taken in matching foods consumed with those in composition tables. Entering dietary information into a dietary analysis program requires trained personnel in areas such as food composition, food nomenclature, food preparation methods, and the eating habits of the research population (Stumbo, 1992). Consistency must be attained in assigning food codes, portion-size weights to food items, and handling missing data for accurate and reliable nutrient analysis information (Stumbo, 1992).

2.8.1 Nutrient Analysis of Long Term Care Menus

In order to have a better understanding of the dietary intakes of the institutionalized elderly, it is important to know whether the meals served to the residents are nutritionally balanced in terms of macronutrients, vitamins, and minerals. A limited number of studies examine the nutrient content of meals provided to elderly residents residing in LTC facilities. Previous studies determining nutrient content of menus in more than one LTC facility (8-14) are greater than 15 years old (Barr, Chrysomilides, Willis, & Beattie, 1983; Leighton & Harrill, 1968; Sempos, Johnson, Elmer, Allington, & Matthews, 1982). Current studies (>1990) are few and examine the nutritional adequacy of menus from 1-2 LTC facilities (Johnson et al., 1995; McCargar et al., 1995). In the last 30 years dietary practices, food products on the market, food composition tables, computerized diet analysis systems, and recommended nutrition recommendations (RDAs and RNIs) have changed, making past menu analysis out-dated. Table 2.7 describes five research studies conducted over a 27 year period.

Table 2.7. Nutrient analysis of LTC facility menus reported in research studies.

	Leighton et al., 1968	Sempos et al., 1982	Barr et al., 1983	Johnson et al., 1995	McCargar et al., 1995 ^a
No. of Nursing Homes	8	14	1	1	2
No. of days	4	nr	5	28	6
Snacks Included	yes	nr	no	yes	yes
Energy (kcal)	1645	2054	1738	2153	(-)
Protein (g)	66	77	53	88	(-)
Carbohydrate (g)	188	--	239	--	(-)
Fat (g)	70	--	64	--	(-)
Crude Fibre (g)	--	4	--	--	--
Fibre (g)	--	--	--	--	15.1
Vitamin A (RE)	1531	1712	923	--	(-)
Vitamin D (μ g)	--	--	--	11	--
Vitamin E (mg)	--	--	--	21	--
Vitamin C (mg)	61	94	102	124	(-)
Thiamin (mg)	0.89	1.3	1.0	1.8	(-)
Riboflavin (mg)	1.7	2.0	1.4	2.6	(-)
Niacin (mg)	21	14	22	--	(-)

Continued...

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	Leighton et al., 1968	Sempos et al., 1982	Barr et al., 1983	Johnson et al., 1995	McCargar et al., 1995 ^a
Vitamin B ₆ (mg)	--	1.4	--	1.6	(-)
Vitamin B ₁₂ (μg)	--	5.6	--	6.2	(-)
Folate (μg)	--	262	--	281	(-)
Pantothenic Acid (mg)	--	5.6	--	--	(-)
Calcium (mg)	930	1018	680	1342	(-)
Magnesium (mg)	--	262	--	--	(-)
Iron (mg)	10.3	13	12	14.8	(-)
Zinc (mg)	--	12	8	9.7	(-)
Potassium (mg)	--	--	--	3064	(-)

a. Data not available. Researchers indicate menus met the RNI's for persons 75 years of age and older (Health and Welfare Canada, 1990).

-- Indicates nutrient not analyzed.

(-) Indicates value not published.

nr Indicates value not reported.

2.9 Methods Used to Measure Food Consumption of the Institutionalized Elderly

Determining the dietary intake of institutionalized elderly is of prime importance in providing adequate nutritional care (Sahyoun et al., 1988; Traughber, Erwin, Risley, & Schnelle, 1983). Dietary assessment of elderly residents provides information on nutritional status, monitors dietary sufficiency, assists in the management of medical conditions, and enables health care professionals to set realistic nutrition goals. Assessing the usual dietary intakes of the elderly residing in LTC facilities is difficult (Sahyoun et al., 1988). Many dietary assessment techniques exist, which include both prospective (e.g., weighed and observed intakes, food records) and retrospective methods (e.g., diet history, 24-hour recall, food frequency questionnaires, interviews). However, most of these methods tend to rely on self-reported intake, which is not appropriate for an institutionalized elderly population. Due to their physical disabilities (e.g., hearing loss, visual impairment) and medical conditions (e.g., dementia), most institutionalized elderly are not able to assist in dietary assessment and may hinder the collection of accurate information (Traughber et al., 1983). Conducting dietary assessments in an institution may also interfere with the employees' duties and the institution's resources (Sahyoun et al., 1988) and disrupt residents' customary habits. Therefore, the identification of dietary assessment methods that are simple, reliable and accurate in assessing usual intakes of institutionalized elderly by trained personnel is required.

After an examination of the literature on nutrient intakes of the elderly in LTC facilities, 10 articles that have assessed the nutritional adequacy of food consumed by the elderly in LTC facilities using a variety of dietary assessment techniques were selected for review. The articles reviewed were chosen based on the following criteria: ≥ 1985 ; research conducted in a LTC environment such as in a nursing home and/or in a geriatric long-stay unit in a hospital; subjects ≥ 65 years of age; and having similar nutrition and dietary practices (i.e., studies conducted outside the United States and Canada that used different dietary practices were excluded). Table 2.8 lists these research studies. The

number of subjects examined in the ten studies ranged from 32 - 352, with a mean age between 74 - 85 years old. Seven studies examined both men and women, whereas three studies examined only women.

A variety of prospective and retrospective dietary assessment approaches were used in the selected studies to determine nutritional intakes of the institutionalized elderly. The techniques utilized included observed intakes ($n = 4$), diet history ($n = 1$), weighed intakes ($n = 2$), estimated and weighed intakes ($n = 2$), and food frequency questionnaires ($n = 1$). For an institutionalized elderly population, not all of these techniques are appropriate and their suitability depends on the particular research situation (Lasheras et al., 1999).

2.9.1 Weighed Intakes

Weighed dietary intakes are determined by weighing foods immediately before consumption and subtracting the weight of the leftovers, edible and inedible portions, at the end of each meal (Klaver, Burema, van Staveren, & Knuiman, 1988). Electronic food balances are used to give accurate and precise measurements of food consumed, however, they can be extremely time consuming and expensive in terms of equipment and trained personnel (Bingham, 1987). Weighed intakes are collected by free-living subjects (Bingham et al., 1988) and used by field researchers to validate other dietary assessment techniques such as observed (Traugher et al., 1983) or photography (Bird & Elwood, 1983). Weighed intakes are also used by researchers to assess intakes of subjects unable to weigh their own foods (e.g., children, institutionalized persons).

The principle in weighed intakes is to obtain a “usual” dietary intake from subjects by examining the foods eaten for 3-7 days (Bingham et al., 1988). To obtain dietary intakes from free-living subjects, they must be trained in weighing and recording the foods that they consume. Self-reported weighed intakes have been shown to be the most accurate method of dietary assessment over a seven day period (Bingham et al., 1988). However, this method requires the subject to be literate and cooperative (Lee & Nieman, 1996). If unskilled subjects are involved, errors may occur in the weighing

Table 2.8. Dietary intakes of the institutionalized elderly.

Research Study	Number of Subjects	Mean Age (y) (mean \pm SD)	Methodology		Nutrients of Concern	General Results
			Dietary Assessment	Nutrient Analysis		
Nguyen et al., 1985	38 (23F + 15M)	nr	observation; 3 consecutive days	Food Composition Table (Paul & Southgate, 1978)	energy, folate, vit C, D & E, Fe, Ca, Zn, fibre	NH residents capable of feeding themselves eat less adequately than residents requiring assistance
Sahyoun et al., 1988	270 (F + M)	81	observation; 3 consecutive weekdays	Massachusetts Nutrient Data Bank System	M&F: energy, vit D & B ₆ , folate, Zn; M: vitA	Subjects' dietary intakes adequate compared to free-living
Lowik et al., 1992	54 (F)	83 \pm 8	10-day modified diet history & cross check; 1-day weighed + 9-days estimated	Dutch Food Composition Table (computerized version, 1986)	NH: energy, Fe, thiamin, vit A, B ₆ & C	Energy & nutrient intake of NH residents < independent living
Lipski et al., 1993	50 (35F + 15M)	81 \pm 7	7-day weighed	Microdiet Dietary Analysis System, UK	energy, vit D, E & B ₆ , folate, Mg, fibre, retinol, Fe & pantothenic acid	Elderly long-stay subjects under-nourished
McCarger et al., 1995	32 (29F + 3M)	84 \pm 6	observed & weighed; 3 consecutive days	CBORD Diet Analyzer based on the CNF	fibre	Overall, intakes of subjects \geq RNIs

Continued...

Research Study	Number of Subjects	Mean Age (y) (mean \pm SD)	Methodology		Nutrients of Concern	General Results
			Dietary Assessment	Nutrient Analysis		
Johnson et al., 1995	51 (F)	85	observation; 7 consecutive days	Nutritionist III	Fe, Zn, Ca & vit D	Intakes adequate overall. Diet consistency did not affect nutrient intakes.
Rudman et al., 1995	34 (32F +2M)	75	observation; 3 consecutive days	Nutritionist IV	energy; <50% RDA of >50% subjects, Zn, Mg, Mn, Cu, & vit E	Majority of subjects have inadequate intakes
44 van der Wielen., 1996	40 (F)	82 \pm 7.1	dietary history; 4 weeks	Dutch Food Composition Table (computerized version, 1987)	thiamin, riboflavin, vit B ₆ & C	Intakes below the minimum requirements for half of NH residents
Gloth III et al., 1996	77 (56F+21M)	NH: 77 \pm 1.3 CHB: 80 \pm 1.6	observation; 3 days	VAX 780 Main Frame, Digital Electronics nutrient database, Washington, DC	NH: vit B ₆ , Zn & Mg CHB: vit B ₆ & D, folate, Ca, Mg & Zn	Institutionalization may be associated with better dietary intakes
Lasheras et al., 1999	352(218F +134M);161NH+191C	NH: 80 C:72	food frequency questionnaire	Wander-Sandoz, Barcelona, 1990	NH: fibre, vit C, A & D	NH residents have better dietary intakes than community living elderly
nr- not reported		NH- nursing home	CHB- Community Home Bound			

process such as when to tare the scale (Bingham, 1987). In addition, subjects may change their usual diet to make weighing and recording easier (Lee & Nieman, 1996).

When assessing diets in LTC settings, subjects typically do not conduct their own weighed food intakes as there is limited space in facilities, and the subjects may have physical disabilities hindering them from participating in this manner. Weighed intakes, however, has been conducted by trained research personnel in an institutionalized setting (Barnes & Hodkinson, 1988; Lipski et al., 1993; Rudman et al., 1995). In this situation, problems associated with subjects weighing their own foods, such as response bias, training, and errors in data collection are minimized and/or controlled. This method seems appropriate for LTC facilities which deliver entire meals (beverages, entree, and dessert) to residents on trays. The difficulty arises when food is served to residents in a dining room using a nontraditional food service system such as food service or nursing employees providing table service to residents. In this setting, it may be difficult to capture all of the foods served and eaten by residents as they may get second helpings, spill food, or trade food with table mates. Thus, it is important to employ quality-control measures to monitor these issues. Vincent and Gibson (1982) evaluated the dietary intakes of 19 chronic geriatric psychiatric patients. Food intakes were determined by weighing meals served to residents on trays for three consecutive weekdays and observing the meals to ensure that the delivered food was actually eaten by the subjects.

2.9.2 Observed Intakes

Dietary intakes are determined by observing foods consumed during mealtimes and estimating the weight of food eaten using household measurements, food models or photographs. This approach has been described by Bingham et al. (1988) as the “observed estimated record” or the “observed weighed record” conducted by field workers. Typically, the former method is performed by subjects themselves (Klaver et al., 1988), however, studies in Norway and Denmark have used trained staff in hospitals and institutions to estimate food intakes of bedridden patients, elderly, mentally handicapped subjects, and children in day care centres (Bingham et al., 1988). These

studies tend to use a combination of techniques such as the observed weighed record and the recall method (to cover snacks served in between meals). A study conducted by Lowik et al. (1992) used both weighed and observed dietary assessment methods, by a dietitian, to measure food consumption of elderly institutionalized women for 10 days. Special attention was also given to foods brought into residents by friends and relatives, or beverages consumed between meals. However, reliability may be questioned for this study as weighing was only used for the first day of the data collection. The same technique was not applied for the entire duration of the study and the researchers did not determine if there were any differences between data collected by weighed or observed methods. For elderly residing in LTC facilities, the observed estimated record and the observed weighed record may not be appropriate. These methods are time consuming, require foods to be weighed and estimated using resources such as household measurements, food models, scales or photographs, and require the active involvement of trained personnel for each meal (Bingham et al., 1988).

Observed intakes, alone, have been used to determine dietary intakes of LTC elderly residents (Gloth III et al., 1996; Johnson et al., 1995; Nguyen et al., 1985; Pokrywka et al., 1997; Sahyoun et al., 1988). In direct observation, trained personnel observe food consumption behaviour and visually estimate food intake (Gittelsohn, Shankar, Pokhrel, & West, 1994). This method eliminates memory problems, inaccurate reporting, literacy issues, or error associated with question development as seen with retrospective methods (i.e., dietary history, 24-hour recall, food frequency questionnaire) and prospective methods (i.e., food records) (Gittelsohn et al., 1994; Lee & Nieman, 1996). Also, prospective methods such as self-administered food diaries and weighed intakes are considered intrusive and may interfere and influence dietary behaviours (Gittelsohn et al., 1994).

Unlike weighed intakes, the accuracy of observed intakes depends on the skill of the observer (Pokrywka et al., 1997). Gittelsohn et al. (1994) examined the accuracy of direct observation in food-weight estimations. Ten locals from Nepal were trained in observational techniques and estimation of food weight for three months then tested for

thirty sessions (6,902 observations). The observer estimates of food weights were highly correlated with actual weights ($r=.96$). The observers improved with training. The accuracy of the estimates were influenced by food characteristics such as small quantities (less than 20 g), nonstaple foods, and foods high in volume, low in weight, thus giving less accurate measures.

McCargar, Hotson and Nozza (1995) conducted an estimated dietary intake study with 32 elderly patients at two acute care hospitals. To determine the accuracy of estimated intakes, a dietitian estimated the weights and volumes of standard hospital servings for meals then compared them to measured food items from duplicate trays of the same meal. The estimated versus measured values were compared until an accuracy of within 5% of the two methods was reached. Thus, in an institutionalized setting, observing foods consumed during mealtimes may be the most appropriate method in assessing dietary intakes as it is easy to perform, inexpensive, and does not interfere with food service delivery. Therefore, it is essential that only one trained researcher (to maintain consistency) estimate the weights or volumes of foods accurately using standardized methods.

2.9.3 Diet History

Diet histories involve the collection of detailed information on an individual's usual food intake over the recent past, last 3 days, past month, or a year (Lee & Nieman, 1996). Foods consumed and the details regarding portion sizes, recipes, and frequency of use are obtained by trained interviewers. The diet history method consists of a three part assessment as developed by Burke (1947); a detailed face-to-face interview to assess usual food consumption, a cross-check frequency list, and a 3-day food record. Presently, this dietary history method is seldom used (Bingham et al., 1988). Instead, the dietary history is modified to include only the face-to-face interview and the cross-check frequency list. This retrospective method has many advantages such that it assesses usual nutrient intakes, provides detail about meal patterns, food consumption, and nutrient intake in a short period of time, detects seasonal changes, correlates well with

biochemical measures, involves minimal subject involvement, and requires no literacy or numeracy skills (Lee & Nieman, 1996; Nelson & Bingham, 1997). The disadvantages of using this method include memory and conceptualization issues, interviewer bias, exaggeration of regular dietary practices by subjects, coding difficulties, expensive, and labor intensive (Lee & Nieman, 1996; Nelson & Bingham, 1997). This method may not be the most appropriate for LTC residents as cognitive impairment is common among this population (Canadian Study of Health and Aging Working Group, 1994), which may affect the accuracy of the dietary recalls.

Van der Wielen, de Wild, de Groot, Hoefnagels, and van Staveren (1996) assessed the dietary intakes of four groups of elderly people, using a modified version of the dietary history method (excluded the 3-day food record) (Bingham et al., 1988). Four groups of elderly were included: nursing home residents (n=40; F); people at admission to a nursing home (n=21; F (11), M (10)); free-living elderly with sedentary lifestyle (n=120; F (68), M (52)); and physically active free-living elderly people (n=66; F (32), M (34)). The dietary history was conducted by trained investigators in the form of face-to-face interviews with subjects from all four groups. For each subject, the interviewers gathered general information regarding food consumption patterns of weekdays and weekends. Then the interviewers assessed the subject's usual intake by covering the last four weeks of dietary intake. The interviewer used a checklist to determine foods eaten, their amounts, frequency of use, irregularities in their eating pattern, and differences between weekday and weekend intake. In addition, snacks and recipes were discussed. Portion sizes of foods and household measures were estimated with the help of 105 photographs of different portion sizes of 23 items. For the nursing home group, the menus from the last four weeks were collected for each participant, and recipes, brands of food products, and portion sizes were obtained from the cooks.

Van der Wielen et al. (1996) found that sedentary elderly people living in nursing homes or awaiting admission into a nursing home have lower dietary intakes of thiamin, riboflavin, and vitamins B₆ and C. Even though this method has been validated against a 3-day weighed record (Nes, van Staveren, Zajkas, Inelmen, & Moreiras-Varela,

1991), it may not be appropriate for institutionalized elderly. This method is highly subjective and relies on an individual's memory (Bingham et al., 1988), and since cognitive impairment is common among nursing home residents, the dietary intakes may not be reliable. The researchers did not determine the cognitive abilities of the subjects. Also in the study, nursing home residents suffered from chronic somatic disabilities, which may have influenced their dietary intakes. Diet histories can be a lengthy, burdensome process on individuals, especially when illnesses are present. The researchers also explained that they had experience with conducting dietary histories on groups of healthy, free-living elderly, but not with the institutionalized elderly. Therefore, the dietary intakes from the nursing home elderly in this study may be inaccurate.

2.9.4 Food Frequency Questionnaire

Food frequency questionnaires estimate how frequently certain foods are consumed by an individual over a certain time period. The questionnaire may consist of a list of individual foods (≤ 100) or food groups and standard portion sizes for each food item. Respondents are asked to indicate how many times a day, week, month, or year that they usually consume foods on the list (Lee & Nieman, 1996). This method is inexpensive, simple, and quick that can be completed by subjects or by trained personnel. It can also be used to determine dietary intakes of a large number of subjects. The disadvantages of using this method are: 1) foods listed may not be representative of the most common foods consumed by subjects, 2) the development of the questionnaire is difficult and time-consuming, 3) data collection is limited, and 4) the reliance on the subject to describe his/her diet may be variable.

Lasheras et al. (1999) used a food frequency questionnaire to examine the dietary intakes of 161 institutionalized, and 191 free-living elderly men and women. A dietitian obtained information on food consumption of all of the subjects using a food frequency questionnaire. Food amounts were recorded in household units, by volume, or by measuring with a ruler. If these methods were not possible, subjects were verbally asked if the portion of food eaten was smaller, equal to or larger than an established model.

The results indicated that the nursing home residents had nutritional intakes greater than the elderly residents living in their own homes. Compared to other dietary assessment techniques and research studies identified in Table 2.8, Lasheras et al. (1999) conducted the most dietary intakes using the food frequency method. These researchers chose this method because it is simple and easy to use, can be administered to a large population sample, and it measures the relative intake of specific nutrients.

2.10 Theoretical Framework

2.10.1 General Systems Theory

The theoretical framework used to explain and guide the thought process for this thesis was adapted from the literature on the General Systems Theory (GST) as it applies to the field of organizational development and management (Mink, Mink, Downes, & Owen, 1994; Spears, 2000). The GST provides a framework to explain the interactions and the interrelationships that occur between specific components within an organization and within its environment. It assists in identifying the factors that influence the functioning of an organization from both an internal and external perspective.

The GST has evolved over time and can be traced back to ancient philosophers. It was not until World War II that the ideas on the GST were developed by an Austrian biologist, Ludwig von Bertalanffy. His writings on the GST were originally published in 1945 as an attempt to overcome specialization. Bertalanffy promoted the view that systems not only interact as separate whole entities, but also interact with their external environments (Barker, Sturdivant, & Smith, 2000). GST later emerged in the late 1950s and early 1960s in response to the compartmentalization of scientific disciplines (Mink et al., 1994).

The terms “systems theory”, “systems thinking”, “systems approach”, and “systems perspective” are used frequently and interchangeably in contemporary organizational development literature (Mink et al., 1994). Systems thinking de-emphasizes the separate parts of a structure as the basis for an organization (Mink et al.,

1994) by adopting an emphasis of understanding organizations that does not focus on the separation and study of constituent parts (Barker, Sturdivant, & Smith, 2000). A systems perspective focuses on the totality of the entire organization and how processes link parts together. There are many assumptions of the systems perspective such as: it is a holistic entity; all parts of the system are interdependent; all parts of the system work together to create synergy; the system is composed of many subsystems which function within the larger system and within its surrounding environment; the extent of interaction of a system with its environment is determined by its degree of openness; the parts of a system respond dynamically; the system attempts to maintain a current state in response to changes; the system has a goal; the system has a purpose; the system has the ability to achieve the same end using different means; feedback mechanisms are in operation to correct changes in a system's overall performance; and the system contains an input-output device which allows for a continuous flow of resources (e.g., materials, ideas, and personnel) through the system (Mink et al., 1994).

Although a systems approach has considerable heuristic and practical value for understanding organizations it does have a few limitations. It lacks the ability to adapt to change as determined by growth and intraorganizational conflict since the system is considered a whole entity (Peery, 1975). Even though this is a weakness, the primary limitation to the application and use of this theory lies with those using it (Peery, 1975), as the assumptions of the theory may not be understood or applied appropriately.

General Systems theory has been applied to organizations across a wide variety of disciplines in the physical, biological, and social science arenas (Kast & Rosenzweig, 1973; (Barker, Sturdivant, & Smith, 2000). Various models for the systems approach also have been developed to meet the goals and objectives the various disciplines (e.g., physics, biology, technology, sociology, food service organizations, etc). By the mid 1960s, the systems theory became known as a useful tool in managing food service operations. The general systems theory has provided a guiding framework for managers of food service organizations to facilitate problem solving and decision making (Spears, 2000). A major example is the Food Service Systems Model proposed by Vaden (1980)

(Figure 2.1).

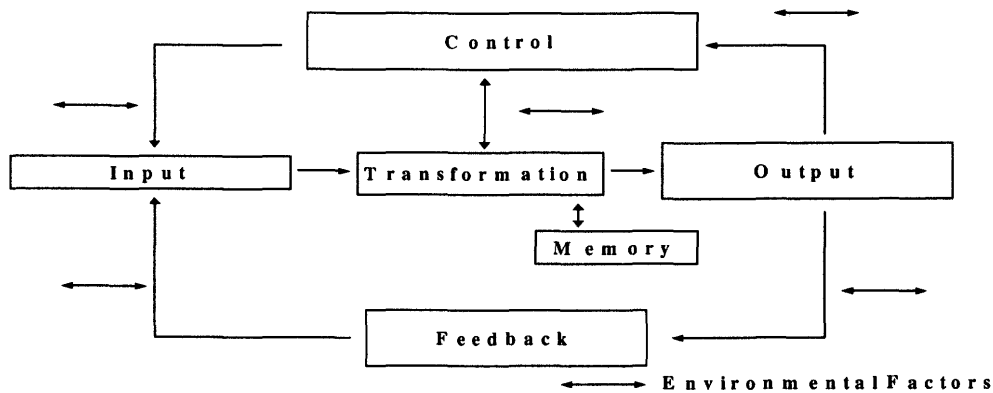


Figure 2.1. Food service systems model of an organization (Vaden, 1980; Spears, 2000).

The Food Service Systems Model (Vaden, 1980) consists of six components: input, transformation, output, internal and external controls, memory, and feedback (Vaden, 1980; Spears, 2000). All of these components are subject to influence by both internal (e.g., food experiences) and external (e.g., the environment in which the system operates) environmental factors. Vaden posits that a food service system is affected by and impacts its environmental context. The two-way arrows represent the unspecified bi-directional relationship between a systems model and the environment in which it operates. Input refers to the resources that are incorporated into the system to assist and contribute to the production of goods and services for the organization. These resources include human (e.g., labour and skills), physical (e.g., materials and facilities) and operational (e.g., money, time, utilities and information) sources. Transformation involves the process of changing inputs into outputs (e.g., activities involved in food production). The process involves management functions (e.g., planning, organizing, leading), functional subsystems (e.g., procurement, production, distribution), and linking processes (e.g., decision making, communication). Within the transformation stage, controls are set. Internal and external controls provide direction to organizations to

ensure that their resources are used effectively and efficiently to accomplish their goals and objectives within legal and regulatory guidelines. Internal controls refer to the goals, objectives, standards, policies, and procedures of the organization. External controls consist of local, provincial, and federal laws, regulations, and guidelines (e.g., menu, Canada's Food Guide to Healthy Eating). The output is the product of the transformation process. In food services this relates to the quality and quantity of meals provided, customer satisfaction, employee satisfaction, and financial accountability. Memory includes stored information (e.g., inventory, financial, personnel, master menu cycles, forecasting) pertaining to the operation of an organization. The feedback component refers to the process by which information in a system is received from its internal and external environments. Feedback may be expressed as positive or negative. The feedback loop is essential in this model as it enables food service organizations to recognize where adjustments or changes need to be made. If the food served to residents of a LTC facility is unacceptable, corrective action may be taken in the input stage, such as purchasing quality food items, training staff, or in the transformation stage, such as the improving the food preparation techniques.

The food service systems model that was developed by Vaden (1980) to illustrate applications of the systems theory to management to food service organizations was constructed in the late 1970's. With the changing approaches to the healthcare industry, these terms do not reflect the current themes in health promotion and evaluation (e.g., resources, outcomes, indicators). Moreover, findings and applications from the field since its development suggest that a revision of both terminology and refinement of predicted processes may be warranted. A likely promising focus is to examine the role that the transformation processes have on outputs and feedback to inputs and controlling factors.

CHAPTER 3

OVERVIEW OF METHODOLOGY

3.1 Food Services in Long Term Care

The purpose of this research was to examine food services provided to the elderly (> 65 years of age) residing in Saskatoon District Health LTC facilities. Research was conducted in four separate phases: 1) Menu Analysis; 2) Resident Food Service Satisfaction; 3) Food Service Practices; and 4) Dietary Intakes of the Elderly. Table 3.1 outlines the four research studies. Phase 3 (Food Service Practices) was funded by Saskatoon District Health and only the menu planning information may be used for discussion purposes in this thesis. Phases 1 (Menu Analysis), 2 (Resident Food Service Satisfaction), and 4 (Dietary Intakes of the Elderly) were conducted concurrently. These four phases are described in detail in chapters 4, 5 and 6.

3.2 Research Design

3.2.1 Study Population

All LTC facilities (n=18) from Saskatoon District Health (SDH), Saskatoon, Saskatchewan were invited to participate in the study. The eighteen LTC facilities and their residents were the focus of this research.

Saskatoon District Health, the largest of the 32 community-managed health districts in the province of Saskatchewan, describes itself as one of the few comprehensive, fully-integrated health service networks in Canada (Saskatoon District Health, 2001). SDH encompasses approximately 50+ rural and urban communities and

Table 3.1. Summary of the research studies: Assessment of food service delivery to elderly residents in Saskatoon District Health long term care facilities.

Phase	Project Title	Data Collected	Partnering Organization
1	Nutrient Content of Food Offered to Elderly Residents	October 1997 - April 1998	College of Pharmacy and Nutrition, University of Saskatchewan
2	Food Service Satisfaction of Elderly Residents	October 1997 - October 1998	College of Pharmacy and Nutrition, University of Saskatchewan and Saskatoon District Health
3	Food Service Practices in Care of the Elderly	May 1998 - March 1999	College of Pharmacy and Nutrition, University of Saskatchewan and Saskatoon District Health
4	Nutritional Adequacy of Food Consumed by Elderly Residents	January 1999 - October 1999	College of Pharmacy and Nutrition, University of Saskatchewan

occupies a 65 kilometre radius from the City of Saskatoon. The District is responsible for health services provided by three acute care hospitals and 17 LTC facilities, of which fourteen are urban and three are rural. At the time the study was conducted, there were 18 LTC facilities (Appendix A), one of which has since relocated into an existing facility, providing a total of 1,543 beds. These LTC facilities are publicly subsidized and licensed under *The Housing and Special-Care Homes Act* (Saskatchewan Health, 1980). In Saskatchewan, the term “special care home” is used to describe LTC facilities, where children, young, and older adults are housed. The demographics of the SDH special care home population is presented in Table 3.2. There were approximately 1,516 residents in SDH special care homes, of which 33% were male and 67% were female (McCulloch, 2001).

Table 3.2. Characteristics of residents residing in SDH special care homes^a.

Sex	Age Categories (yrs)							Total
	≤17	18-34	35-49	50-64	65-74	74-84	>85	
Male	0.4%	3.0%	6.5%	8.9%	12.7%	34.7%	33.7%	33.2%
Female	0.2%	0.9%	2.6%	5.8%	9.1%	30.3%	51.1%	66.8%
Total	0.3%	1.6%	3.9%	6.9%	10.3%	31.8%	45.3%	100%

a. Percentages represent a typical count over the research period (1997-1999).

3.2.2 Special Care Home Recruitment

The initial recruitment procedure began in June 1997, where SDH special care home administrators (n=14) attended an information meeting about the four phases of the research project. The goal of the meeting was two fold; (1) to clarify concerns expressed by the administrators and (2) to enlist their special care home into the study. The project is described in detail (Appendix B). Unanimous support was obtained from the administrators present at the meeting. In September 1997, a letter summarizing the outcomes of the meeting along with the proposed research study were sent to all of the administrators of the SDH special care homes (Appendix C).

A second information meeting was convened in October 1997 with food service representatives (i.e., Food Services Supervisors, Cooks, Directors of Support Services and Food Services) from each of the SDH special care homes. The session was repeated twice to accommodate all of the representatives. Eleven representatives attended one of the two sessions. Seven representatives who were unable to attend either of the sessions were contacted in person. All sessions, whether they were in a group or in-person, addressed the details of the research project (Appendix B) and clarified any questions expressed by the representatives.

3.2.3 The Four Research Phases in Relation to the Systems Model

The food service systems model (Vaden, 1980; Spears, 2000) as described in

Chapter 2 consists of six components: input, transformation, output, controls, memory, and feedback. Each of the four research phases corresponds with one of the six components (Figure 3.1) based on the specific research areas examined.

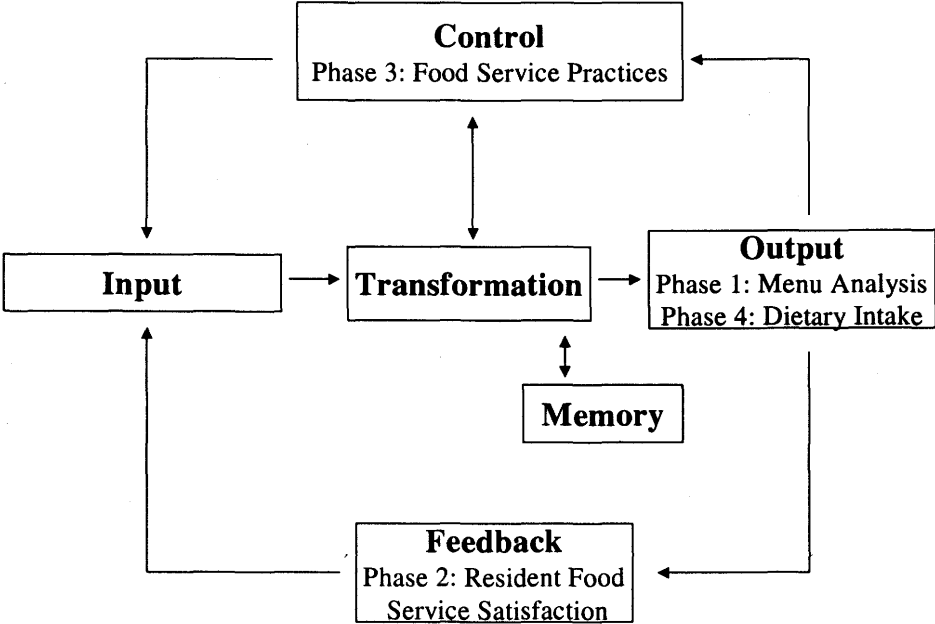


Figure 3.1. Four research phases and the food service systems model (Adapted from Vaden, 1980).

3.2.4 Methods

The SDH special care homes participating in the four research phases are listed in Table 3.3. Details of the methodology used in each phase are discussed separately in chapters 4, 5 and 6.

Table 3.3 Participation by Saskatoon District Health special care homes in the four phases of the research study.

Special Care Home	Rural or Urban	Phase 1	Phase 2	Phase 3	Phase 4
A	Urban	×	×	✓	×
B	Urban	✓	✓	✓	×
C	Urban	✓	✓	✓	×
D	Urban	✓	✓	✓	×
E	Urban	✓	✓	✓	✓
F	Rural	✓	✓	✓	×
G	Urban	✓	✓	✓	×
H	Urban	✓	✓	✓	×
I	Urban	×	×	✓	×
J	Rural	✓	✓	✓	×
K	Urban	✓	✓	✓	✓
L	Urban	✓	✓	✓	✓
M	Urban	✓	✓	✓	✓
N	Urban	×	×	×	×
O	Rural	✓	✓	×	✓
P	Urban	✓	✓	×	×
Q	Urban	×	×	×	×
R	Urban	×	×	×	×
Total Participating		13	13	13	5

3.2.5 Ethical Approval

Ethical approval was obtained from the University of Saskatchewan Advisory Committee on Ethics in Human Experimentation (Appendix D), and site specific committees where they existed (Appendix E).

3.3 Summary

The Assessment of Food Service Delivery to Elderly Residents in Saskatoon District Health Long Term Care Facilities was a multidimensional research study with a primary focus on food services provided to elderly LTC residents. The common link between the four research phases of the project was food consumption of elderly residents. Food consumption is affected by a variety of factors positively or negatively as illustrated by the food service systems model (Vaden, 1980). The uniqueness about this study was the recognition that the food services environment plays an important role in food consumption. Many interactions may occur within the system contributing to short or long-term effects on LTC residents dietary intakes and food service satisfaction.

Chapter 4 presents the evaluation of the nutrient composition of regular menus, compares the values to the current nutrient recommendations, determines the daily number of food group servings, and current menu planning practices provided by the special care homes (Phases 1 and 3).

Chapter 5 presents an examination of the nutrient content of food consumed by elderly residents on regular, non-therapeutic diets. This was achieved by using two dietary assessment methods, observed and weighed, to gather the usual dietary intakes of a group of elderly residents in special care homes (Phase 4).

Chapter 6 presents the assessment of food service satisfaction of elderly residents with regard to meals and food services received in their special care homes. Satisfaction with quality of life issues related to eating also was addressed (Phase 2).

CHAPTER 4

MENU EVALUATION AND FOOD SERVICE MENU PRACTICES OF LONG TERM CARE FACILITIES IN A HEALTH DISTRICT IN SASKATCHEWAN

4.1 Introduction

Canada's population is aging, contributing to a greater proportion of individuals 65 years of age and older than in previous years. The majority of elderly residents, individuals 65 years of age and older, live in their own homes (Statistics Canada, 1999), but as one ages, the likelihood of institutional care increases (Novak, 1997). Long term care (LTC) facilities provide 24 hour care and support services to individuals from a variety of ages with a wide range of medical problems. In 1996, 6.2% of Canadian seniors lived in LTC facilities. Saskatchewan, at 6.7%, had the fourth highest number of seniors residing in LTC facilities based on the percentage of elderly in the province (Statistics Canada, 1999).

Residents residing in LTC facilities require special nutritional care (Powers & Folk, 1992). Providing nutritional care to this group is challenging. Institutionalized elderly are at risk for inadequate dietary intakes (Powers & Folk, 1992), protein-energy malnutrition (Morley, 1998), and nutrient-specific deficiencies (Elmstahl, Persson, Andren, & Blabolil, 1997), which can lead to increased morbidity and mortality (Chandra, Imbach, Moore, Skelton, & Woolcott, 1991). There are a variety of factors that may influence an elderly individual's dietary intake, hence, nutritional status. The aging process leads to changes in taste and smell perceptions. Medical conditions (e.g., diabetes), medication usage (e.g., drug-nutrient interactions), psychological conditions

(e.g. dementia), social aspects (e.g., bereavement), and environmental factors (e.g., living arrangements) also play a role in food consumption (Marcus & Berry, 1998).

Furthermore, a combination of any of these variables may increase the resident's difficulty to eat or even enjoy meal times.

When delivering nutritional care to elderly in LTC facilities, cycle menus are intended to provide residents a variety of foods that contain an adequate amount of energy, vitamins, minerals, and fibre to meet their nutritional requirements. Cycle menus offer an assortment of food items daily that rotate within a specified number of days or weeks. Overall, studies that have examined the nutritional content of menus offered to elderly residents of LTC facilities have shown to be inadequate in fibre, vitamin A, vitamin C, vitamin B₆, folate, zinc, iron, magnesium, and calcium (Barr, Chrysomilides, Willis, & Beattie, 1983; Johnson, Smiciklas-Wright, Soucy, & Rizzo, 1995; Leighton & Harrill, 1968; McCargar, Hotson, & Nozza, 1995; Sempos, Johnson, Elmer, Allington, & Matthews, 1982). These studies, however, are small in scope (includes one or two LTC facilities) (Johnson et al., 1995; McCargar et al., 1995), or are over 10 years old (Barr et al., 1983; Leighton & Harrill, 1968; Sempos et al., 1982). Nutrients examined range from only ten (Leighton & Harrill, 1968) to eighteen (McCargar et al., 1995). Dietary fibre, vitamin D, and vitamin E were often excluded from the nutritional analysis (Barr et al., 1983; Johnson et al., 1995; Leighton & Harrill, 1968; McCargar et al., 1995; Sempos et al., 1982). Furthermore, dietary practices, food products, food composition tables/databases, computerized diet analysis systems, and nutrition recommendations have changed (i.e., Dietary Reference Intakes (Institute of Medicine, 1998) making past LTC menu analysis no longer current.

Dietary intake studies which examine food and beverages ingested by individuals (Klaver, Burema, van Staveren, & Knuiman, 1988) have been conducted with the institutionalized elderly (Gloth III, Tobin, Smith, & Meyer, 1996; Lasheras, Gonzalez, Garcia, Patterson, & Fernandez, 1999; van der Wielen, de Wild, de Groot, Hoefnagels, & van Staveren, 1996). Studies of this nature require valid and reliable dietary assessment methods developed for elderly people (van Staveren, 1994). These studies are time-

consuming, labour intensive, expensive, and may be difficult to undertake. Nutrient analysis of cycle menus is a simple and inexpensive process to examine the variety and nutrient composition of foods offered to residents in LTC facilities. Information obtained using this process may be used by dietitians, food service supervisors, and other health care professionals in LTC to facilitate problem solving and decision making when planning, revising or implementing menus.

The goals of this study were to: 1) evaluate the nutrient composition of regular, non-therapeutic menus; 2) compare the nutrient values of the menus to the current nutrient recommendations; 3) determine the daily number of food group servings provided by the menus; 4) examine the type and quantity of snacks provided in between meals; and 5) examine the current menu planning practices utilized by the LTC facilities.

4.2 Methods

4.2.1 Study Population

The 18 LTC facilities from Saskatoon District Health (SDH) participated in the study. Ethical approval was obtained from the University of Saskatchewan Advisory Committee on Ethics in Human Experimentation, and site specific ethics committees where they existed.

4.2.2 Menu Analysis

4.2.2.1 Questionnaire Design and Administration

To obtain nutrient information on current cycle menus a questionnaire was developed (Appendix F). The questionnaire was divided into three sections: 1) Foods served for breakfast, lunch and supper (59 foods); 2) Foods offered between meals (snacks) in the morning, afternoon and evening (27 foods); and 3) Standard food items (i.e., foods not shown on the cycle menu) served regularly at breakfast, lunch, supper, and snacks. A list of food items was given in sections one and two to assist with the quantification of foods offered on the cycle menus. Foods listed were considered

common food items served by LTC facilities. The lists were developed by the researcher, a Registered Dietitian, who was familiar with foods offered to residents in LTC facilities and who also referred to a variety of LTC menus provided by the SDH LTC facilities. Additional blank lines were provided for foods not listed. Section 3, requesting standard food items, consisted of blank lines to enable respondents to indicate the standard food items that they serve daily. Sections one and two were delineated into five columns: (1) Food category; (2) Standard measure; (3) Breakfast or Morning; (4) Lunch/Dinner or Afternoon; and (5) Supper/Dinner or Evening. Section 3 contained two columns; (1) Food category; and (2) Standard measure, for breakfast, lunch/dinner, supper/dinner, and morning, afternoon, and evening snacks. Food service representatives (i.e., Food Services Supervisors, Cooks, Directors of Support Services and Food Services, and Dietary Staff) from each of the LTC facilities were asked to complete the questionnaire. Participants were requested to provide standard measures of each food item using the following units: scoop numbers, millilitres (ml), grams (g), ounces (oz), or cups. If the measure varied with each meal, the participant was asked to fill in the standard measure in the appropriate meal time category. Participants were instructed to indicate only the standard food portions offered to residents having no food restrictions and/or special requests at meals and snacks. Participants were also requested to provide a photocopy of their current cycle menu and all of the recipes corresponding with week II (7 days; Monday - Sunday). Week II of the cycle menu was randomly selected as the LTC menus were greater than 4 weeks in duration.

The questionnaire was pilot tested by food service representatives from two of the eighteen LTC facilities to clarify wording discrepancies, problems with sentence structure, and content. As no problems were found, these LTC facilities were not retested and their responses were included in the overall data analysis. The questionnaire was mailed to 15 LTC facilities, as one declined to participate prior to mailing out the survey. In total, questionnaires were completed by 13 of 17 SDH LTC facilities (76% completion rate). Of these 13 LTC facilities, 10 were urban and 3 were rural. They ranged in size from 28 to 266 residents, totalling 1,236 residents, 78% of which were 65

years of age and older. The mean age of the elderly residents in the LTC facilities were 85 ± 8 years of age and 32% were male and 68% were female.

4.2.3 Food Service Practices Survey

4.2.3.1 Questionnaire Design and Administration

Information on food service practices from SDH LTC facilities was collected. A 30-item self-administered questionnaire (Appendix G) was developed, using closed and open-ended questions, to address the following six areas: 1) standards, philosophies and policies governing the planning and delivery of food and nutrition services to elderly residents; 2) menu planning; 3) staffing; 4) food service delivery; 5) demographics; and 6) general comments regarding nutritional care. Nine of the 30 questions specifically related to menu planning practices. The initial questionnaire was pilot tested using food service representatives from two of the eighteen LTC facilities to identify and clarify any wording or sentence discrepancies. As no problems were found with the survey, these two LTC facilities were not retested. The questionnaire was mailed to the remaining SDH LTC facilities. Food service representatives from each of the LTC facilities were asked to complete the questionnaire.

Thirteen questionnaires were completed and returned (72% completion rate). Of these 13 LTC facilities, 11 were urban and 2 were rural. These LTC facilities ranged in size from 28 to 238 residents, totalling 1,325 residents, 84% of which were 65 years of age and older.

4.2.4 Data Analysis

Long term care facilities that completed both the menu analysis and the food service practice surveys were included in the analysis. Eleven LTC facilities, nine urban and two rural, completed both surveys.

4.2.4.1 Menu Analysis

Meals from week II of the LTC cycle menus were entered into the nutritional

analysis program, Nutritionist IV (First Databank, The Hearst Corporation, San Bruno, California). Food items, and their corresponding portion sizes, typically served to an elderly resident on a regular, non-therapeutic diet, with no texture modifications were coded. Breakfast, lunch and supper, excluding snacks, for seven consecutive days were analyzed. Where there was a selective menu (i.e., two choices of entrees), the first choice entree, as indicated by the LTC facility was entered. Portion sizes for each food item were obtained from the completed questionnaires. Recipes for food items present in week II of the cycle menus were coded separately. Recipes were checked against food composition tables (Pennington, 1998). Canadian foods were chosen from Nutritionist IV where possible to reflect Canadian fortification practices. When a food item was absent from the database, a similar food, based on nutrient composition, was entered. All of the data was reviewed by the researcher for consistency and coding errors. Whenever there were discrepancies in the data collected by the questionnaires, the food service representatives from each LTC facility were contacted and responses were clarified. Foods offered to residents as between meal snacks were not nutritionally analyzed because their variability in serving size made it impractical to quantify. Instead, foods provided for snacks were identified from the questionnaire and categorized by food groups based on Canada's Food Guide to Healthy Eating (CFGHE).

4.2.4.2 Food Groups

Portion sizes of food items offered by the LTC facilities in week II were compared to CFGHE serving sizes and then placed into one or more of the four food groups depending on the type of food item (i.e., food with one or more ingredients). The food guide consists of four major food groups each with a range of serving sizes to account for an individual's age, sex, body size, and activity level. Food group recommendations applicable to an adult population are: grain products (5-12); vegetables & fruit (5-10); milk products (2-4); and meat & alternatives (2-3). One serving of grain products is equivalent to 1 slice (30 g) of bread, or ½ cup (125 ml) pasta or rice. One serving of vegetables & fruit is equivalent to ½ cup (125 ml) vegetables or fruit, or ½

cup (125 ml) juice. One serving of milk products is equivalent to 1 cup (250 ml) milk, or 2 slices (50 g) cheese. One serving of meat & alternatives is equivalent to 50-100 g meat, poultry or fish, or 2 tablespoons (30 ml) peanut butter. For combination foods (e.g. beef vegetable stew), serving sizes and recipes were examined to determine the corresponding serving size of each food item and its respective food group.

4.2.5 Statistical Analysis

4.2.5.1 Menu Analysis

Data were compiled and analyzed using SPSS (Statistical Package for the Social Sciences) release 9.0.1 for Windows (SPSS Inc., Chicago, IL). Values were expressed as means, standard deviations (SD), medians, ranges, and percentages of the current nutrient recommendations. The average nutrient data of energy, protein, carbohydrate, and fat were compared to the Recommended Nutrient Intakes (RNIs) for males and females aged 50-74 and 75+ (Health and Welfare Canada, 1990). To account for a decrease in activity participation by elderly residents in LTC facilities, the energy recommendation for males and females aged 50-74 and 75+ was lowered by an estimated 200 kcal/day (McCargar et al., 1995). No current RNI exists for sodium, however, an intake of 2,400 mg/day or less is recommended in the United States (National Research Council, 1989). The average nutrient data for vitamin E, vitamin C, thiamin, riboflavin, niacin, vitamin B₆, vitamin B₁₂, folate, magnesium, vitamin A, iron, zinc, calcium, and vitamin D were compared to the Recommended Dietary Allowance (RDA) for males and females aged 51-70 and 70+ years, or Adequate Intake (AI) when RDAs were not available (Institute of Medicine, 1997; 2000). There are no current recommendations available for dietary fibre, however according to the World Health Organization (1990), dietary fibre intake should be between 27 - 40 g/day. In absence of the DRI methodology on planning, nutrients from the LTC facility menus were considered “met” if they were greater than or equal to 100% of their specified RNI, RDA, or AI. Daily recommended servings were expressed as means, standard deviations (SD), and ranges for each of the four food groups.

4.2.5.2 Food Service Practices Survey

Results to the nine questions pertaining to menu planning practices were compiled and summarized. Participation rates and frequency (%) of responses were reported for closed-ended questions, whereas common themes (responses consistently given for seven or more LTC facilities) and sub-themes (responses mentioned by six or less LTC facilities) were summarized for open-ended questions.

4.3 Results

4.3.1 Menu Analysis

Energy requirement was met by the female categories only (Table 4.1). The distribution of protein, carbohydrate, and fat as a percentage of total energy was 15.4%, 52.4%, and 33.2%, respectively. Dietary fibre intake was 14.0 ± 2.4 g/day with a range of 10.8 - 18.0 g/day.

Mean nutrient values suggest that the nutrient recommendations for protein, vitamin A, thiamin, riboflavin, niacin, vitamin B₁₂, and iron were met ($\geq 100\%$, RNI, RDA or AI) in all the LTC facilities (Table 4.2). Vitamin E, vitamin C, niacin, vitamin B₆, folate, magnesium, zinc, calcium, and vitamin D recommendations were not met for males or females in either age categories. The sodium content of the menus was $2,735 \pm 295$ mg/day with a range of 2,389 - 3,440 mg/day.

Comparisons between the LTC menus and CFGHE recommendations for daily servings from each food group are given in Table 4.3. Many of the LTC facilities provided less than the suggested minimum number of CFGHE servings for adults for vegetables & fruit, grain products, milk products, and meat & alternatives; 82%, 55%, 18%, and 18%, respectively.

All of the LTC facilities indicated that they provide snacks. Foods provided were nutrient dense (high ratio of nutrients to energy) and encompassed all four food groups. Table 4.4 lists snacks served by the LTC facilities.

Table 4.1. Energy and macronutrient content of LTC facility menus^a and comparison to the Canadian recommended nutrient intakes.

Macronutrient	Mean ± SD	Median	Range	% kcal ^b	% RNI ^c			
					50-74y Males	50-74y Females	75y + Males	75y + Females
Energy ^d								
Calories (kcal)	1841 ± 129	1827	1615 - 2034		88 (11) ^e	115 (0)	102 (4)	123 (0)
Kilojoules (kJ)	7732 ± 542				2100 ^f	1600	1800	1500
Protein (g)	71 ± 8	70	63 - 86	15.4	113 (0) 63	131 (0) 54	120 (0) 59	129 (0) 55
Carbohydrate (g)	241 ± 17	243	219 - 266	52.4	--	--	--	--
Fat (g)	68 ± 8	70	56 - 77	33.2	--	--	--	--

a. Group mean of the average of seven days of menus from 11 LTC facilities.

b. Percentages add up to 101% due to a small error in the conversion of grams to kilocalories using the following standard calculations: (i.e., carbohydrate = 4 kcal/g; protein = 4 kcal/g; fat = 9 kcal/g).

c. RNI = Recommended Nutrient Intakes (Health and Welfare Canada, 1990); LTC facilities not meeting RNI as indicated by a cutoff of <100% of the specified RNI.

d. Values calculated from the RNI and adjusted by a decrease of 200 kcal/day to account for light physical activity.

e. Number of LTC facilities not meeting RNI.

f. RNI for specified sex and age group in italics.

-- No RNIs for fat and carbohydrate.

Table 4.2. Micronutrient content of LTC facility menus^a and comparison to recommended levels using dietary reference intakes (DRIs).

Vitamin	Mean \pm SD ^b	Median	Range	% RDA ^{cd}			
				51-70 Males	51-70 Females	70 + Males	70 + Females
Vitamin E (mg)	10.3 \pm 1.6	10.8	7.5 - 12.4	69 (11) ^e 15 ^f	69 (11) 15	69 (11) 15	69 (11) 15
Vitamin C (mg)	78 \pm 11	77	61 - 95	87 (8) 90	104 (5) 75	87 (8) 90	104 (5) 75
Thiamin (mg)	1.4 \pm 0.1	1.4	1.1 - 1.5	117 (1) 1.2	127 (0) 1.1	117 (1) 1.2	127 (0) 1.1
Riboflavin (mg)	2.0 \pm 0.1	2	1.8 - 2.2	154 (0) 1.3	182 (0) 1.1	154 (0) 1.3	182 (0) 1.1
Niacin (mg)	15.7 \pm 1.7	16.3	13.6 - 18.1	98 (5) 16	112 (3) 14	98 (5) 16	112 (3) 14
Vitamin B ₆ (mg)	1.3 \pm 0.2	1.3	0.9 - 1.7	76 (10) 1.7	87 (8) 1.5	76 (10) 1.7	87 (8) 1.5
Vitamin B ₁₂ (μ g)	7.9 \pm 4.8	5	4.0 - 16.8	329 (0) 2.4	329 (0) 2.4	329 (0) 2.4	329 (0) 2.4
Folate (μ g)	188 \pm 29	185	149 - 238	47 (11) 400	47 (11) 400	47 (11) 400	47 (11) 400

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Vitamin	Mean \pm SD ^b	Median	Range	% RDA ^{cd}			
				51-70 Males	51-70 Females	70 + Males	70 + Females
Magnesium (mg)	263 \pm 27	267	214 - 300	63 (11) <i>420</i>	82 (11) <i>320</i>	63 (11) <i>420</i>	82 (11) <i>320</i>
Vitamin A (μ g)	1644 \pm 663	1250	946 - 3105	183 (0) <i>900</i>	235 (0) <i>700</i>	183 (0) <i>900</i>	235 (0) <i>700</i>
Iron (mg)	13.0 \pm 1.7	13.5	9.7 - 15.9	163 (0) <i>8</i>	163 (0) <i>8</i>	163 (0) <i>8</i>	163 (0) <i>8</i>
Zinc (mg)	8.8 \pm .95	8.9	7.3 - 10.3	80 (11) <i>11</i>	110 (3) <i>8</i>	80 (11) <i>11</i>	110 (3) <i>8</i>
Calcium (mg)	1002 \pm 151	998	821 - 1383	84 (10) <i>1200</i>	84 (10) <i>1200</i>	84 (10) <i>1200</i>	84 (10) <i>1200</i>
Vitamin D (μ g)	6.9 \pm 1.3	7.2	5.3 - 8.8	69 (11) <i>10</i>	69 (11) <i>10</i>	46 (11) <i>15</i>	46 (11) <i>15</i>

a. Group mean of the average of seven days of menus from 11 LTC facilities.

b. Mean values for vitamin B₁₂ and folate are positively skewed as liver and onions appear on some menus.

c. RDA = Recommended Dietary Allowance (Institute of Medicine, 1997); calculated as a group mean.

d. All nutrients have RDAs, except for calcium and vitamin D which have Adequate Intake (AI) values.

e. Number of LTC facilities not meeting RDA.

f. RDA for specified sex and age group in italics.

Table 4.3. LTC facility menus^a compared to Canada's Food Guide to Healthy Eating^b.

Food Group Category	Daily Recommended Servings	Mean \pm SD	Range	LTC facilities not providing the minimum CFGHE Recommended Servings ^c
Grain Products	5-12	4.9 \pm 1.5	1.9 - 8.9	6
Vegetables & Fruit	5-10	4.6 \pm 1.2	1.9 - 6.6	9
Milk Products	2-4	2.4 \pm 0.7	1.2 - 4.3	2
Meat & Alternatives	2-3	2.4 \pm 0.8	0.8 - 5.0	2

a. Group mean of the seven days of menus from 11 LTC facilities.

b. Health and Welfare Canada, 1990

c. Based on minimum CFGHE recommended servings.

Table 4.4. Foods provided between meals at LTC facilities^{ab}.

Food Group	Morning	Afternoon	Evening
Grain Products	toast with margarine; muffins; cookies	bread; sandwiches; muffins; crackers; assorted cookies, squares, and cake	toast/bread with margarine; sandwiches; muffins; biscuits; crackers; assorted cookies and baked goods
Vegetables & Fruit	sweetened and unsweetened juices; fresh fruit	sweetened and unsweetened juices; fresh fruit	sweetened and unsweetened juices; fresh fruit
Milk Products	milk; cheese	milk; cheese; pudding; ice cream	milk; cheese; yogurt; pudding; ice cream
Meat & Alternatives	--	sliced meat	sliced meat; peanut butter
Other Foods	coffee/tea with cream/milk & sugar	coffee/tea with cream/milk & sugar; hot chocolate	coffee/tea with cream/milk & sugar; jam

a. 11 LTC facilities.

b. Snacks reported by two or more LTC facilities.

4.3.2 Food Service Practices Survey

Results to the questions pertaining to menu planning practices are reported in Table 4.5.

4.3.2.1 Standards, Philosophies & Policies

Respondents from the 11 LTC facilities reported that the factors that prompted a change in menus included: concerns, requests and likes/dislikes of clients/residents (100%); seasonal changes and availability of food items (82%); special events/holidays (45%); cost and budget (27%); waste audits (36%) and staff/cafeteria customer satisfaction (18%).

In order to plan menus, LTC facilities obtain suggestions from residents by informal resident input (91%), and formal resident input such as food satisfaction surveys (82%), resident council meetings (55%), and feedback from families (27%).

4.3.2.2 Menu Planning

Menu cycles from the 11 LTC facilities ranged from 4 to 7 weeks in length with a mean of 5.6 ± 1.0 weeks. Ninety-one percent of LTC facilities belong to a group purchasing plan. Thirty percent of these LTC facilities use the menu cycle provided by their specific group purchasing plan. LTC facilities indicated that their last major menu revisions were conducted < 1 year ago (36%); 1-2 years ago (36%); and > 2 years ago (27%). LTC facilities base their menu planning on Canada's Food Guide to Healthy Eating (100%) and Program Guidelines for Special Care Homes (Saskatchewan Health, 1990) (55%). LTC facilities provide their largest meal at noon (45%) or evening (55%).

4.3.2.3 Food Service Delivery

All LTC facilities(100%) provide snacks to their residents. Eight of the eleven LTC facilities offer snacks to all of their residents, while the remaining three facilities offer snacks to those on therapeutic diets. For LTC facilities who do not offer all residents snacks, a kitchenette or a fridge is stocked and a resident may retrieve a snack

for him/herself or individually ask to be included on snack delivery.

4.3.2.4 General Comments / Nutritional Care

LTC facilities (n=8) indicated that they required more information on the following areas: nutritional analysis information of recipes, diets, and menus (38%); and standardized recipes (50%).

4.4 Discussion

The purpose of this study was to examine the nutrient content, food group distribution of regular menus, and current menu practices employed by LTC facilities. Menu planning in LTC facilities is important as it impacts on the nutritional quality and variety of food offered to residents of these facilities. In order to offer meals that meet the daily nutrition recommendations for older adults, cycle menus must be designed to provide a wide variety of foods that are nutrient dense (high ratio of nutrients to energy) and meet or exceed the current nutrition recommendations. This practice serves to ensure that residents are offered meals that provide them with the required amount of energy, vitamins, and minerals for optimal health.

The menus of eleven LTC facilities were analyzed for nutrient composition and variety. Overall, menus were close to the recommended distribution of 12% to 15% of energy as protein, greater than 55% energy as carbohydrate, and no more than 30% of energy as fat (Health and Welfare Canada, 1990) at 16% , 52%, and 33%, respectively. These results are similar to those of other studies which previously examined the nutrient content of LTC menus (Barr et al., 1983; Johnson et al., 1995; McCargar et al., 1995; Sempos et al., 1982).

LTC facilities did not meet the nutrient recommendations for vitamin E, vitamin C, niacin, vitamin B₆, folate, magnesium, zinc, calcium, and vitamin D for males and females of both age groups. Energy needs were not met for males. Several studies have also shown that some LTC menus are below the nutrient recommendations for these

Table 4.5. Menu planning questions and responses selected from the SDH Food Practices Survey.

Food Service Practice Area	Menu Planning Question	Responses ^a
75 Menu Planning	Standards, Philosophies & Policies	
	What are the factors that prompt a change in your menus?	Concerns, requests & likes/dislikes of clients/residents (100%); seasonal changes & availability of food items (82%); special events/holidays (45%); cost & budget (27%); waste audits (36%); staff/cafeteria customer satisfaction (18%)
	How do you obtain input from elderly residents in regards to menu planning?	Informal resident input (91%); food satisfaction survey (82%); resident Council Meeting (55%); family feedback (27%)
	What is the length of your menu cycle in weeks?	5.6 ± 1.0 weeks (Mean ± SD)
	Do you belong to a Group Purchasing Plan?	Yes (91%) ; No (9%)
	Do you use the menu cycle provided by this group?	Yes (30%); No (70%)
	When was the last major menu revisions at your care home?	< 1 y ago (36%); 1-2 y (36%); > 2 y ago (27%)
	Do you base your menu planning on any published guidelines?	Canada's Food Guide to Healthy Eating (100%) Program Guidelines for Special Care Homes (Saskatchewan Health, 1990) (55%)

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Food Service Practice Area	Menu Planning Question	Responses ^a
	When is your biggest meal provided?	Noon (45%); Evening (55%)
Food Service Delivery	Do you provide snacks?	Yes (100%) ¹
General Comments / Nutritional Care	Are there any specific areas in the nutritional care of the elderly that you would like to know more about?	No response (27%) Nutritional Analysis Information of Recipes, Diets and Menus (38%) Standardized Recipes (50%)

a. Responses based on 11 LTC facilities.

¹During data analysis, LTC facilities were contacted to clarify whether snacks were provided to all residents or to those strictly on therapeutic diets. 73% of care homes indicated that they provide snacks to all residents.

nutrients: energy, males only (Sempos et al., 1982), vitamin A (Leighton & Harrill, 1968), ascorbic acid (Leighton & Harrill, 1968), vitamin B₆ (Sempos et al., 1982), folate (Sempos et al., 1982), iron (Leighton & Harrill, 1968), magnesium (Sempos et al., 1982), calcium (Barr et al., 1983), and zinc (Johnson et al., 1995; Sempos et al., 1982). Menus that do not meet the nutrition recommendations may place elderly at increased risk for vitamin and mineral deficiencies and thus, health consequences such as malnutrition, bone fractures, and increased morbidity and mortality.

Canada's Food Guide to Healthy Eating servings were not met by all of the LTC facility menus. This may have contributed to the low quantity of nutrients present in the menus for all age-sex groups. The inadequacy of vitamin C, folate, niacin, magnesium, and dietary fibre may be attributed to the lack of vegetables and fruit, and grain products in the menus. Vitamin B₆ was lower than the RDA suggesting that the type of foods selected from the meat and alternatives group were not high in this nutrient. Organ meats, pork, fish, seeds, legumes, dried yeast, and whole grains, which are excellent sources of vitamin B₆, were not common in the seven days analyzed. Calcium and vitamin D also were below the nutrient recommendations for individuals over 51 years of age, even though the LTC facility menus provided the recommended daily servings of milk products. Inadequate amounts of vitamin D and calcium in the LTC menus may be attributed to the standard of comparison, AI. Compared to the previously used RNIs, AIs for calcium are 400 mg/day higher for males and females 51 years of age and older. For vitamin D, AIs are 5 µg/day higher than the RNIs for males and females 51-70 years and 10 µg/day higher for both sexes over the age of 70. Thus, the elderly may not be able to meet the nutrient recommendations for these two nutrients by consuming food alone. The LTC facilities met the recommended servings per day of meat and alternatives as illustrated by adequate values of protein, vitamin A, iron, thiamin, riboflavin, and vitamin B₁₂. Vitamin C and zinc were not met by males as the nutrient recommendations are higher for males than females (vitamin C: 90 mg and 75 mg ; zinc: 12 mg and 9 mg, respectively). As for the low vitamin E values in the menus, it has been noted that Nutritionist IV does not adequately analyze for this vitamin (Lee & Nieman, 1996), and

our data may underestimate the amount.

Dietary fibre has been gaining more importance in geriatric nutrition as it is known to improve glucose tolerance, reduce the incidence of constipation, prevent colon cancer, and lower serum lipids (Chernoff, 1995). Constipation is a common problem in the elderly which may lead to impacted bowels if dietary fibre intake is not sufficient. By increasing the fibre and fluid intake of older adults, bowel dysmotility may be prevented or minimized (McCargar, 1995). The results of our study show that foods provided by LTC menus contained 14 g/day of dietary fibre similar to the 15.1 g/day found by McCargar et al. (1995). Dietary fibre intake should be increased to 27 g/day (World Health Organization, 1990).

Foods provided between meals were not included in the nutritional analysis of the LTC facility menus, which may have contributed to the apparent low nutrient content of the menus. Snacks provided by the LTC facilities were nutrient dense, covered all of the four food groups, and would generally be considered healthy food choices. Respondents of the menu analysis survey indicated that snacks were provided to all residents. In contrast, the food service survey showed that not all LTC facilities provide snacks to residents on both regular and therapeutic diets for all snacks times (i.e., morning, afternoon and evening). Typically, the emphasis has been on providing snacks to residents on texture modified diets (i.e., pureed) and therapeutic diets (i.e., diabetes) to prevent any further medical complications (i.e., dehydration and hypoglycemia). LTC facilities that did not provide snacks to all residents have kitchenettes stocked with a variety of foods from the four food groups accessible 24 hours. However, residents may not be healthy or mobile to retrieve snacks on their own or may be cognitively unaware that they are thirsty or hungry (Marcus & Berry, 1998). Unless snacks are incorporated into cycle menus and all residents are consistently provided snacks, residents may continue not receiving them, placing them at nutritional risk.

Food service operations in LTC facilities are diverse. The food practices survey indicated that LTC facilities strive to meet residents' nutrition- and food-related needs as identified through the standards, philosophies and policies governing the food and

nutrition service departments. To plan menus, LTC facilities indicated that they believed in feedback, both formally and informally, from residents and their families. According to the food practices survey, LTC facilities based their menu planning on *Program Guidelines for Special Care Homes* (Saskatchewan Health, 1990) and Canada's Food Guide to Healthy Eating (CFGHE) (Health and Welfare Canada, 1990). These program guidelines are neither comprehensive or current. The food group servings of the menus did not meet the recommendations of CFGHE (Health and Welfare Canada, 1990) even though the food service representatives indicated that they followed CFGHE to plan menus. This may be due to the inclusion of an older version of Canada's Food Guide into the program guidelines. The guidelines also suggest that LTC facilities provide an evening nourishment/snack, but there is no mention of a snack for the morning or the afternoon. Therefore, there is no reinforcement of mandatory snack delivery to all residents, which would increase the nutrient content of the menus. Currently, there are no provincial regulations specific to food service delivery, nutritional care or dietitian time/services in LTC facilities in Saskatchewan (Barker, 1998).

Since malnutrition is commonplace in LTC (Morley & Silver, 1995), standards should be in place to ensure residents are provided foods that are adequate in energy and nutrients. Snacks should not be restricted to residents on therapeutic diets or at selected times of the day. Snacks should be made available 24 hours to all residents. Care should be taken to ensure residents with cognitive impairment, and mobility and communication difficulties be offered snacks regularly. Providing snacks to all LTC residents may be regarded as a preventative measure to undesirable health outcomes, however, this may not be a feasible practice in all LTC facilities. Therefore, it may be even more important to ensure that menus themselves are nutritionally adequate.

4.5 Conclusion

This is a timely study as nutrition recommendations have changed, but the LTC facility menus have not yet reflected this change. LTC facility menus should meet or

exceed the nutrition recommendations for the elderly to ensure that these residents are offered an adequate supply of energy, vitamins, and minerals for optimal health. Menus should be monitored for variety as each of the four food groups contributes specific nutrients essential for the normal functioning of the body. However, with changes in nutrition recommendations it may be difficult or even impossible for residents of LTC facilities to consume the recommended amount of some nutrients through meals alone. With this point in mind, it may be necessary to incorporate snacks into cycle menus to increase their energy and nutrient composition. If residents have difficulty meeting the nutrient recommendations by consuming food alone, nutritional supplementation or tailored fortification practices of certain food items may need to be considered. Up-to-date provincial regulations for food service delivery and nutritional care in LTC facilities also are needed as providing care to the elderly is complex and requires continuity.

CHAPTER 5

THE NUTRITIONAL ADEQUACY OF FOOD CONSUMED BY ELDERLY RESIDENTS OF LONG TERM CARE FACILITIES IN A HEALTH DISTRICT IN SASKATCHEWAN

5.1 Introduction

Determining the dietary intakes of the elderly residing in long term care (LTC) facilities is of prime importance because of the prevalence of malnutrition (Sahyoun et al., 1988; Traugher, Erwin, Risley, & Schnelle, 1983). Recent estimates indicate that the rate of malnutrition among institutionalized elderly ranges between 5% to 85% (Whitehead & Finucane, 1997; Morley, 1998). Dietary assessment aids health care professionals in obtaining information on nutritional status, dietary adequacy, and progression of medical conditions. It also enables the setting of realistic nutrition goals for the elderly LTC resident.

Research on the dietary intake of LTC elderly residents has determined that the typical diet tends to be below recommended nutrient levels (Gloth III, Tobin, Smith, & Meyer, 1996; Lasheras, Gonzalez, Garcia, Patterson, & Fernandez, 1999; van der Wielen, de Wild, de Groot, Hoefnagels, & van Staveren, 1996). Lasheras et al. (1999) examined the nutritional status of an elderly sample living independently with a sample living in nursing homes. They found that the independently living group (community-living) had a higher percentage of inadequate diets than did the nursing home residents, moreover, the majority (over 75%) of both groups consumed below the recommended dietary allowances of fibre, calcium, vitamin C, vitamin A, and vitamin D. Similarly, Gloth III et al. (1996) found that the diets of a sample of community-living elderly were less adequate

than those of a nursing home elderly sample. The study also found that the diets of both groups did not meet the nutrient recommendations for vitamin B₆, magnesium, and zinc. Lasheras et al. (1999) and Gloth III et al. (1996) both concluded that elderly living in institutional care facilities had better diets than those living independently in the community, but the dietary intakes of both groups were deficient in many nutrients. In contrast, van der Wielen and colleagues (1996) found that sedentary, nursing home residents had lower dietary intakes of the vitamins thiamin, riboflavin, vitamin B₆, and vitamin C compared to physically active, independent community-living elderly. However, the independent elderly were still at risk for inadequate nutrient intakes. In either case, these studies show that consumption of an adequate diet in energy, vitamins, and minerals becomes essential as the elderly are likely to have chronic disabilities and an increased vulnerability to illness. Otherwise, poor nutritional status is likely to compromise their health and well-being.

Many dietary assessment methods (e.g., weighed and observed intakes, food records, diet history, 24-hour dietary recall, food frequency questionnaires, interviews) exist to examine the food intakes of individuals, however, the determination of usual intakes in LTC elderly residents is often difficult. Most of the assessment methods rely on self-reported intake, which may be inappropriate for the institutionalized elderly. Physical disabilities (e.g., hearing loss, visual impairment and impaired movement) and medical conditions (e.g., dementia) may hinder the collection of accurate dietary intake data (Traugher et al., 1983). Obtaining actual dietary intakes in an institutionalized setting also may interfere with the employees' duties and the institution's resources (Sahyoun et al., 1988) as well as disrupt residents' usual dietary habits. Simple, reliable, and accurate dietary assessment methods are needed for the prevention, early detection, and continuous follow-up of nutrition related problems in elderly residents residing in LTC facilities.

The observation method has been used in field research to determine the amount and type of food consumed by subjects (Gloth III et al., 1996; Johnson, Smicklas-Wright, Soucy, & Rizzo, 1995; Lowik et al., 1992; Nguyen, Flint, Prinsley, & Wahlqvist,

1985; Sahyoun et al., 1988). This method has been conducted by observing foods independently of any measurement devices or by estimating the weight of food eaten using household measures, food models or photographs. These methods have been shown to be labor intensive and require trained personnel (Bingham et al., 1988). The observation method conducted without any measurement devices (i.e., scale) is a form of direct observation (Gloth III et al., 1996; Johnson et al., 1995; Nguyen et al., 1985; Sahyoun et al., 1988). In this case, trained personnel observe food consumed and visually estimate food intake of subjects. This method eliminates memory problems, inaccurate reporting, literacy issues, or error associated with question development as seen with self-reported dietary assessment methods (i.e., dietary history (van der Wielen et al., 1996); food frequency questionnaire (Lasheras et al., 1999)), which may either under or over report food consumption.

Weighed intakes have been typically regarded as the 'gold standard' of dietary assessment methods for individuals living on their own (Bingham et al., 1988). Weighed intakes have been used in field research to validate other dietary assessment methods (Bingham et al., 1988) and to assess intakes of subjects unable to weigh their own foods (e.g., children and institutionalized elderly). However, subjects in LTC facilities are not usually able to weigh their food items due to limited space and physical disabilities (i.e., paralysis of left hand due to stroke). Lipski et al. (1993) and Rudman et al. (1995) used this method in LTC facilities with trained personnel and found that problems associated with subjects weighing their own foods, such as response bias, training, and errors in data collection were minimized. This method is appropriate when entire meals (beverages, entree and dessert) are delivered to residents on individual trays. But in LTC facilities the focus is on providing a more home-like environment where foods are individually delivered to residents in a common dining area. Therefore, weighing food portions to evaluate dietary intake becomes impractical. Moreover, complete data may not be gathered by this method as food values of second helpings, spilt food, and traded food among table mates are likely to be missed.

The goals of this study were to determine: 1) if elderly LTC residents on regular,

non-therapeutic diets consume an adequate supply of macronutrients, vitamins, minerals, and dietary fibre, and 2) the most appropriate dietary assessment method to measure usual dietary intakes in LTC facilities.

5.2 Methods

5.2.1 Study Population

The 18 LTC facilities from Saskatoon District Health (SDH) participated in the study. Five LTC facilities, four urban and one rural, were randomly selected from the 18 LTC facilities. Sample selection was assisted by food service representatives (i.e., Food Services Supervisors, Cooks, Directors of Support Services and Food Services, and Dietary Staff) from each participating LTC facility. The purpose and design of the study was explained to them so they could assist in identifying appropriate resident participants. Ethical approval for human subjects was obtained from the University of Saskatchewan Advisory Committee on Ethics in Human Experimentation, and site specific ethics committees where they existed.

Food service representatives from each facility were asked to select approximately ten elderly residents; a total of 56 residents (20 males; 36 females) from the five LTC facilities participated. Residents were eligible if they met the following selection criteria: 65 years of age and older; currently consuming a regular diet (non-therapeutic) with or without texture modifications (except for pureed / blenderized meals); and residing in the LTC facility for at least three months. Food service representatives also based their sample selection on minimizing meal service delivery interruptions by selecting residents seated close to one another in the dining area. The food service representatives provided the name, sex, room location, year of birth, diet order, weight, and height of each resident selected for the study (Appendix H). The height was provided as recorded in the subjects' medical charts. The weight of the subjects was obtained from the subjects' monthly weight records. Medical diagnosis of the residents, and whether they needed assistance with meals were collected from medical personnel. The residents of the LTC

facilities were unaware that their dietary intakes were to be measured to reduce the possibility of systematic error (i.e., residents changing their eating behaviour, thus influencing the amount and type of foods eaten).

5.2.2 Dietary Intake Collection Procedures

Dietary intakes of approximately 10 residents from each LTC facility were collected for three consecutive days at breakfast, lunch, and supper for weekdays only. Weekend days were not used as the menu cycle did not change on weekends and subjects were more likely to be out of the facility. Three dietary assessment methods were used; weighing of meals, observation of meals, and photographs of food before and after meal consumption. Dietary intakes were collected with a maximum of five subjects at one time to minimize errors in the data collection process. Two trained personnel (research dietitian and assistant) were responsible for determining the nutrient intakes of the subjects. The research dietitian was responsible for: 1) assessing food intake of residents by observing the amount of food consumed at all meals, 2) delivering meals to residents after food items were weighed and photographed by the research assistant, and 3) collecting all dishes and silverware from residents after they finished their meals. The research assistant, a Senior Nutrition student, was responsible for: 1) weighing all food items served to residents and their leftovers, and 2) taking photographs of each meal before and after the residents finished their meals (Appendix I). The food service delivery systems of each of the LTC facilities were observed prior to commencement of the study in each facility. This “observation day” was used to inform employees about the study. A standard procedure also was developed for each LTC facility in consultation with the food service employees and the resident care aides. Dietary intakes of four non-randomly selected residents from one of the five participating LTC facilities were measured for two days to pretest the standard procedures. The dietary intake data collected from these subjects were not analyzed or included in the study.

Snacks and recipes corresponding with the study dates also were collected. Snacks provided to and eaten by subjects were recorded by nursing or recreation

employees (Appendix J). The recording process was explained to the employees responsible for collecting the information to ensure accuracy of the recorded snacks. The types and amounts of snack items eaten by the subjects were verified with the recorder(s). Recipes corresponding with the dietary intake study dates were obtained from the meal preparation employees. Food products (i.e., brand name and type of canned goods, juices, and other food items) used also were recorded.

5.2.2.1 Weighing of Meals

Meals were weighed using an electronic food scale (Sartorius GMBH, Gottingen, Germany). Prior to each meal, the scale was tested using gram scale weights to ensure proper functioning. All foods were weighed prior to delivery to the subjects, except for standard beverages provided during the meal service, spilt foods/beverages, and foods exchanged by residents. Foods served to the subjects were individually weighed as they were placed onto the plate and the scale was tared for each food item. The weight of the remaining food was subtracted from its initial weight to give the actual amount of food eaten. The name and the weight of each food item was recorded (Appendix K). The weight of the snacks eaten between meals was not collected. Due to varied snack times and a variety of employees delivering snacks at each LTC facility, it was impossible to train all of the staff to carry out this procedure and it was impractical for the researchers to weigh the snacks.

5.2.2.2 Observation of Meals

Food intakes collected by observation were conducted solely by the research dietitian. The dietitian (observer) was responsible for estimating foods provided to the subjects based on household measures, weight, or volume. The observer learned how to estimate the weight or volume of foods by practicing the estimation technique using real foods four months prior to the initial study. Foods were estimated, recorded, and compared to their actual weight or volume as determined by household measures or an electronic scale.

All foods served to the subjects were estimated and recorded (Appendix L). Once the subjects completed their meal, the amount of food eaten was recorded in weight or volume. The same research dietitian implemented the pilot study and the main study.

5.2.2.2.1 Validity of the Observation Method

The observation method was examined by criterion-related validity. The observer's accuracy in estimating a variety of different foods of varying portion sizes was measured after the data collection was completed. Twenty-seven foods were randomly selected based on foods commonly served in LTC facilities and on the four food groups. A research assistant portioned foods and recorded their weights or measures. Once the foods were portioned, the observer independently estimated the amount of the pre-portioned foods.

5.2.3 Menu Analysis

Menu analyses were conducted on all meals from the second week of the five LTC cycle menus. The methods used to collect and analyze these data were described in Chapter 4.

5.2.4 Data Analysis

The individual foods recorded on the weighed and observed dietary intake records were coded and entered into the nutritional analysis program, Nutritionist IV (First Databank, The Hearst Corporation, San Bruno, California). Breakfast, lunch, supper, and snacks, for three days were analyzed for 48 subjects from the original sample of 56. Dietary intake data from eight subjects were not analyzed as some meals were missed from their three day intakes. Recipes used to prepare menu items were coded separately. The recipes were checked against standard food composition tables (Pennington, 1998). Canadian foods were chosen from Nutritionist IV where possible to reflect Canadian fortification practices. When a food was absent from the database, a similar food, based on nutrient composition, was entered. All of the data was reviewed for consistency and

coding errors. Nutritionist IV does not contain imputed values, therefore, if the composition of a food item is missing or partially absent, nutrient values from a similar food item are not included.

To determine the validity of the observation method to the weighed method, the food items from both of the weighed and observed records were matched for each subject; food items missing from either of the records were eliminated.

5.2.5 Statistical Analysis

Statistical analyses were performed using the SPSS computer program (Statistical Package for the Social Sciences) version 9.0.1 for Windows (SPSS Inc., Chicago, IL). The data were initially explored for normality and outliers. Results were considered to be significant if $p < 0.05$.

5.2.5.1 Demographic Data

Subject data was examined as a group ($n=48$) and also divided by gender. Values were expressed as means, standard deviations, ranges, and mean percentages.

5.2.5.2 Validity of the Observation Method

A paired t-test was used to validate the observation method with the weighed method by using food items common in both methods. This test was based on criterion-related validity. Foods not included in both methods were removed. This was conducted by examining the mean of the differences between the intakes determined by the weighed and observation methods. Three subjects of the 48 were removed from this analysis as their weighed intake data was not complete. Further observer accuracy in food estimation was determined by comparing the estimated food measurements to the actual weights/measures of the same foods using Pearson's product-moment correlation coefficients.

5.2.5.2.1 Comparison of Observation vs Weighed Dietary Assessment Methods

Values of the nutrients were expressed as means and standard deviations. A paired t-test was used to test the hypothesis that the mean of the differences between the intakes determined by the weighed and observation methods was equal to zero for each individual. The differences in calculated nutrient intake between the two methods was summarized by the group mean of the differences.

5.2.5.3 Dietary Intake Data

Statistical analyses of the subjects' dietary intakes were conducted using the observation method of dietary assessment. The observation method was found to be a valid measurement of resident intake in an institutionalized setting when compared to the weighed method. It captured more foods than did the weighed method (i.e., beverages, foods traded amongst table mates, spillage, and second helpings of foods).

The observation method which included snacks were expressed as means and standard deviations. These results were used to evaluate the prevalence of inadequacy of the group's dietary intake according to the Dietary Reference Intakes (DRIs) (Institute of Medicine, 1997; 1998; 2000a; 2001) for micronutrients and to the Recommended Nutrient Intakes (RNIs) (Health and Welfare Canada, 1990) for macronutrients. The Estimated Average Requirement (EAR) cut-point method was used to determine the nutrient adequacy of the group of elderly LTC subjects for all micronutrients except iron which was a probability analysis (Beaton, 1994; Institute of Medicine, 2000b; 2001). The EAR cut-point method examines the proportion of individuals in a group with intakes that are below the median nutrient requirement (EAR).

5.3 Results

5.3.1 Subject Characteristics

The study population included 48 elderly residents of which 17 were male and 31 were female. The means (\pm SD), medians, and ranges for age, height, weight and BMI of

the subjects are summarized in Table 5.1. Diet texture type and the need for meal assistance are also described in Table 5.1. The major diagnoses from the study group are listed in Table 5.2. Table 5.3 presents the distribution of the number of diagnoses among males and females. The characteristics and diets of females and males are listed in Appendices M and N, respectively.

5.3.2 Validity of the Observation Method

The mean of the differences (positive) between the observed and weighed intake methods was significant only for dietary fibre and sodium (Table 5.4). Observer accuracy was shown to be 0.857 by the Pearson's product-moment correlation coefficient ($p < 0.001$).

5.3.2.1 Observation vs Weighed Dietary Assessment Methods

The mean of the differences between the two methods for the subjects' averaged three day intakes without snacks was significant ($p < 0.05$) for energy, protein, carbohydrate, fat, vitamin A, thiamin, riboflavin, niacin, vitamin B₆, folate, vitamin B₁₂, vitamin C, vitamin D, calcium, magnesium, and zinc (Table 5.5).

5.3.3 Dietary Intake

Dietary intake of male and female subjects were compared to the DRIs, where available, or the RNIs. For both males and females, Table 5.6 summarizes dietary adequacy in comparison to the Estimated Average Requirement (EAR); Table 5.7 summarizes dietary intake in comparison to the Adequate Intake (AI). The highest prevalence of inadequacy, reported as a percentage, is shown for folate (n=46), magnesium (n=46), zinc (n=46), vitamin E (n=37), vitamin B₆ (n=35), vitamin C (n=22), niacin (n=15), thiamin (n=14), and vitamin B₁₂ (n=9). The mean intake of calcium for females and males was 50% and 65% of the AI, respectively. The mean intake for vitamin D for females and males (>70y) was 29% and 38% of the AI, respectively. Dietary fibre intake was 9.9 ± 3.7 g/day. Mean sodium intake was 2167 ± 626 mg/day.

5.3.4 Comparison of Food Eaten to Food Offered

Seven days of menus of the five LTC facilities were previously analyzed for nutrient composition and the results are presented in Appendix O. Dietary fibre intake was 14.0 ± 2.6 g/day. Mean sodium intake was 2516 ± 239 mg/day. Table 5.8 compares the residents' total dietary intakes (meals and snacks) to the nutrient content of food offered at meals only. As snacks were consumed by 77% of female and 82% of male residents, we expected observed intakes to exceed that offered at mealtime. However, data in Table 5.8 indicate residents consumed much less than offered for most nutrients. It must be noted that the analysis of residents' dietary intakes did not include the same days as those analyzed for the menus, however, multiple days of intake were averaged for both.

Table 5.1 Subject characteristics.

Subject Information	Males (n=17)	Females (n=31)	Total (n=48)
Age (y) Mean \pm SD	86 \pm 9	89 \pm 7	88 \pm 8
Median	89	90	89
Range	68 - 100	71 - 103	68 - 103
Height (cm) Mean \pm SD	174 \pm 7	157 \pm 6 ^a	163 \pm 11
Median	175	157	162
Range	160 - 185	140 - 168	140 - 185
Weight (kg) Mean \pm SD	73 \pm 10	62 \pm 15	66 \pm 14
Median	69	60	65
Range	60 - 93	36 - 106	36 - 106
BMI ^b Mean \pm SD	24.3 \pm 3.2	25.6 \pm 5.7	25.1 \pm 4.9
Median	24	25	24
Range	21 - 30	16 - 44	16 - 44
Diet Texture			
regular ^c	11 (65%)	22 (71%)	33 (69%)
cut-up ^d	1 (6%)	5 (16%)	6 (12%)
minced ^e	5 (29%)	4 (13%)	9 (19%)
Meal Assistance			
yes	5 (29%)	4 (13%)	9 (19%)
no	12 (71%)	27 (87%)	39 (81%)

a. Females: n=28; data from 3 subjects unavailable.

b. Body Mass Index (BMI) calculated as kg/m².

c. Foods provided with no texture modifications.

d. Foods provided in bite-size pieces or as finger foods.

e. Foods provided in a minced, mashed, soft, or finely grated form includes dental soft and ground.

Table 5.2 Major diagnoses that may affect the nutritional status of the elderly subjects participating in the study.

Diagnosis	Males (n=17) n (%)	Females (n=31) n (%)	Total (n=48) n (%)
Anemia	1 (5.9)	1 (3.2)	2 (4.2)
Cancer (active or by history)	1 (5.9)	0	1 (2.1)
Congestive Heart Failure	1 (5.9)	0	1 (2.1)
Coronary Artery Disease	2 (11.8)	3 (9.7)	5 (10.4)
Cerebrovascular Accident	5 (29.4)	11 (35.5)	16 (33.3)
Dementia	12 (70.6)	7 (22.6)	19 (39.6)
Depression	0	1 (3.2)	1 (2.1)
Gastrointestinal Disease	1 (5.9)	3 (9.7)	4 (8.3)
Hypertension	1 (5.9)	7 (22.6)	8 (16.7)
Hypothyroidism	1 (5.9)	1 (3.2)	2 (4.2)
Degenerative Joint Disease	6 (35.3)	16 (51.6)	22 (45.8)
Neurologic Disease	1 (5.9)	5 (16.1)	6 (12.5)
Osteoporosis	1 (5.9)	1 (3.2)	2 (4.2)
Blindness / Poor Vision	0	4 (12.9)	4 (8.3)
Pulmonary Disease	1 (5.9)	0	1 (2.1)
Renal Failure	0	2 (6.5)	2 (4.2)
Other	3 (17.6)	5 (16.1)	8 (16.7)

Table 5.3 Distribution of major diagnoses that may affect the nutritional status of the elderly subjects participating in the study.

Number of Diagnoses	Males (n=17) n (%)	Females (n=31) n (%)	Total (n=48) n (%)
1	6 (35%)	9 (29%)	15 (31%)
2	4 (24%)	13 (42%)	17 (36%)
3	5 (29%)	6 (19%)	11 (23%)
4	2 (12%)	2 (7%)	4 (8%)
5	0	0	0
6	0	1 (3%)	1 (2%)

Table 5.4 Validation of the observed dietary assessment method using weighed dietary intakes^a.

Nutrient	Dietary Intake Method ^b		Difference ^c	P-Value ^d
	Observed without snacks	Weighed without snacks		
Energy (kJ)	4960 ± 1474	4973 ± 1445	-13	0.811
Protein (g)	43 ± 13	42 ± 14	1	0.251
Carbohydrate (g)	153 ± 47	154 ± 47	-1	0.702
Fat (g)	46 ± 17	46 ± 15	0	0.834
Dietary Fibre (g)	8.7 ± 3.7	9.0 ± 4.1	0	0.013
Vitamin A (RE)	1227 ± 755	1188 ± 764	39	0.242
Vitamin E (mg)	8.7 ± 4.3	9.1 ± 3.3	-0.4	0.154
Thiamin (mg)	1.0 ± 0.3	1.0 ± 0.3	0	0.193
Riboflavin (mg)	1.2 ± 0.5	1.3 ± 0.5	-0.1	0.302
Niacin (mg)	10.9 ± 3.5	11.3 ± 4.3	-0.4	0.103
Vitamin B ₆ (mg)	1.0 ± 0.4	1.0 ± 0.4	0	0.914
Folate (μg)	136 ± 57	140 ± 66	-4	0.331
Vitamin B ₁₂ (μg)	5.2 ± 4.9	5.0 ± 5.1	0.2	0.561
Vitamin C (mg)	50 ± 22	52 ± 24	-2	0.189
Vitamin D (μg)	3.8 ± 2.2	3.8 ± 2.1	0	0.818
Sodium (mg)	1900 ± 568	1984 ± 599	-84	0.002
Iron (mg)	9.0 ± 3.2	9.5 ± 4.3	-0.5	0.108
Calcium (mg)	481 ± 230	474 ± 218	7	0.339
Magnesium (mg)	138 ± 59	138 ± 61	0	0.975
Zinc (mg)	5.4 ± 2.4	5.3 ± 2.5	0.1	0.305

a. Expressed as mean ± SD.

b. Group mean of subjects' averaged three day dietary intakes (n=45).

c. Difference = Observed - Weighed

d. Two-tailed paired t-test. The same foods were included in both methods.

Table 5.5 Comparison of dietary intake of macronutrients and micronutrients for subjects using two dietary assessment methods, weighed and observed^a.

Nutrient	Dietary Intake Method ^b		Difference ^c	P-Value ^d
	Observed without snacks	Weighed without snacks		
Kilojoules (kJ)	5573 ± 1512	5023 ± 1390	550	< 0.001
Protein (g)	47 ± 13 (14%)	42 ± 13 (14%)	5	< 0.001
Carbohydrate (g)	178 ± 53 (53%)	154 ± 46 (51%)	24	< 0.001
Fat (g)	49 ± 16 (33%)	47 ± 15 (35%)	2	0.026
Dietary Fibre (g)	9.1 ± 3.6	9.1 ± 4.0	0	0.840
Vitamin A (RE)	1288 ± 728	1166 ± 747	122	0.011
Vitamin E (mg)	9.0 ± 4.1	9.5 ± 3.1	-0.5	0.074
Thiamin (mg)	1.1 ± 0.3	1.0 ± 0.3	0.1	0.030
Riboflavin (mg)	1.4 ± 0.5	1.2 ± 0.5	0.2	< 0.001
Niacin (mg)	12.0 ± 3.3	11.2 ± 4.2	0.8	0.010
Vitamin B ₆ (mg)	1.1 ± 0.4	1.0 ± 0.4	0.1	0.004
Folate (μg)	158 ± 68	140 ± 64	18	0.017
Vitamin B ₁₂ (μg)	5.5 ± 4.7	4.8 ± 5.0	0.7	0.025
Vitamin C (mg)	59 ± 28	52 ± 23	7	0.044
Vitamin D (μg)	4.7 ± 2.3	3.8 ± 2.0	0.9	< 0.001
Sodium (mg)	2047 ± 586	2009 ± 586	38	0.296
Iron (mg)	9.6 ± 3.1	9.5 ± 4.1	0.1	0.612
Calcium (mg)	611 ± 263	473 ± 214	138	< 0.001
Magnesium (mg)	176 ± 58	138 ± 59	38	< 0.001
Zinc (mg)	6.0 ± 2.5	5.3 ± 2.4	0.7	< 0.001

a. Expressed as mean ± SD.

b. Group mean of subjects' averaged three day dietary intakes (n=48).

c. Difference = Observed - Weighed

d. Two-tailed paired t-test.

Table 5.6 Comparison of dietary intake from the observed dietary assessment method with snacks to the Estimated Average Requirement (EAR) for specific nutrients for males and females.

Nutrient	EAR ^a	Mean Intake (n=48)	Observed Intakes with Snacks	
			# Subjects below EAR ^b (n=48)	% Subjects below EAR ^c (n=48)
Folate (μg)	320 (F) ^d	161 \pm 78	30	96%
	320 (M) ^d	196 \pm 59	16	
Magnesium (mg)	265 (F)	175 \pm 38	31	96%
	350 (M)	232 \pm 73	15	
Zinc (mg)	6.8 (F)	5.6 \pm 2.3	24	79%
	9.4 (M)	7.5 \pm 2.3	14	
Vitamin E (mg)	12 (F)	8.0 \pm 2.9	29	77%
	12 (M)	12.7 \pm 5.3	8	
Vitamin B ₆ (mg)	1.3 (F)	1.1 \pm 0.3	25	73%
	1.4 (M)	1.4 \pm 0.5	10	
Vitamin C (mg)	60 (F)	76 \pm 48	12	46%
	75 (M)	78 \pm 45	10	
Niacin (mg)	11 (F)	11.6 \pm 2.7	10	31%
	12 (M)	14.8 \pm 4.2	5	
Thiamin (mg)	0.9 (F)	1.0 \pm 0.2	10	29%
	1.0 (M)	1.3 \pm 0.4	4	
Vitamin B ₁₂ (μg)	2.0 (F)	4.7 \pm 4.2	8	19%
	2.0 (M)	7.2 \pm 5.3	1	
Riboflavin (mg)	0.9 (F)	1.4 \pm 0.4	5	10%
	1.1 (M)	1.8 \pm 0.4	0	
Vitamin A (μg)	500 (F)	1163 \pm 693	3	6%
	625 (M)	1770 \pm 774	0	
Iron (mg) ^e	5 (F)	9.4 \pm 2.7	n/a	6.9%
	6 (M)	12.2 \pm 3.3	n/a	1.4%

a. EAR = Estimated Average Requirement. EAR for nutrients includes the age categories, 51-70 and >70, for both males and females.

b. # Subjects below EAR = number of males and females below EAR.

c. % Subjects below EAR = percentage of males and females below EAR as calculated by the total number of males and females divided by the total number of subjects.

d. F = EAR for females, M = EAR for males.

e. Iron inadequacy determined as probability of inadequate intake (Institute of Medicine, 2001).

Table 5.7 Comparison of dietary intake from the observed dietary assessment method with snacks to the Adequate Intake (AI) for specific nutrients for males and females.

Nutrient	AI ^a	Mean Intake ^b (n=48)
Calcium (mg)	1200 (F) ^c	600
	1200 (M) ^c	783
Vitamin D (51-70y) ^d (μg)	10 (F)	--
	10 (M)	9.1 ^e
Vitamin D (>70y) ^d (μg)	15 (F)	4.4
	15 (M)	5.7

a. AI = adequate intake. AI is an approximation for the average nutrient requirement that appears to sustain a defined nutritional state (Institute of Medicine, 1998).

b. Mean intake using the observed dietary assessment method with snacks.

c. F = AI for females, M = AI for males.

d. AI for vitamin D is divided into two age categories.

e. n=1

-- n=0

Table 5.8 Comparison of the subjects' dietary intakes to the nutrient content of the participating LTC facility menus.

Nutrient	Nutrient Content ^a			
	Mean Dietary Intake with Snacks (n=48) ^{bc}	LTC Facility Menus (n=5) ^d	Difference ^e	% Difference
Kilojoules (kJ)	6304 ± 1726	7526 ± 559	-1222	16
Protein (g)	49 ± 14 (13%)	72 ± 8 (16%)	-23	32
Carbohydrate	212 ± 64 (56%)	232 ± 15	-20	9
Fat (g)	53 ± 17 (31%)	66 ± 11	-13	20
Dietary Fibre (g)	9.9 ± 3.7	14.0 ± 2.6	-4.1	29
Vitamin A (RE)	1378 ± 773	1484 ± 919	-106	7
Vitamin E (mg)	9.7 ± 4.5	10.5 ± 1.2	-0.8	8
Thiamin (mg)	1.1 ± 0.3	1.4 ± 0.1	-0.3	21
Riboflavin (mg)	1.5 ± 0.5	1.9 ± 0.1	-0.4	21
Niacin (mg)	12.8 ± 3.6	15.5 ± 2.0	-2.7	17
Vitamin B ₆ (mg)	1.2 ± 0.4	1.3 ± 0.3	-0.1	8
Folate (µg)	173 ± 73	186 ± 50	-13	7
Vitamin B ₁₂ (µg)	5.6 ± 4.7	6.9 ± 5.5	-1.3	19
Vitamin C (mg)	77 ± 47	77 ± 20	0	0
Vitamin D (µg)	4.9 ± 2.3	7.2 ± 1.4	-2.3	32
Sodium (mg)	2167 ± 626	2516 ± 239	-349	14
Iron (mg)	10.4 ± 3.2	13.4 ± 0.8	-3	22
Calcium (mg)	665 ± 276	960 ± 117	-295	31
Magnesium (mg)	195 ± 59	254 ± 31	-59	23
Zinc (mg)	6.3 ± 2.5	9.0 ± 0.8	-2.7	30

a. Expressed as mean ± SD.

b. Group mean of subjects' averaged three day dietary intakes (n=48).

c. Twenty-one percent of subjects did not consume snacks.

d. Group mean of the average of seven days of menus from the participating 5 LTC facilities.

e. Nutrient Content Difference = Mean Dietary Intake - LTC Facility Menus

5.4 Discussion

The objective of this study was to evaluate the quantity of nutrients consumed by elderly residents living in institutionalized care against new recommendations (Institute of Medicine, 1997; 1998; 2000a; 2001). Determination of the appropriate dietary assessment methodology was a secondary objective. We then related nutrient intakes to nutrient content of food offered, which would indicate whether menus were adequately planned.

A significant portion of elderly men and women in this study consumed less than the current nutrient recommendations. Our analysis indicates that elderly subjects in SDH LTC facilities may be at risk for inadequate intakes of folate, magnesium, zinc, vitamin E, vitamin B₆, vitamin C, niacin, thiamin, vitamin B₁₂, calcium, and vitamin D. In addition, fibre consumption was below the World Health Organization's (1990) suggested range of 27 - 40 g/day. This is a concern as institutionalized subjects are known to have more chronic illnesses and consume prescription medications, which place them at increased nutritional risk. With this in mind, appropriate nutritional intake is necessary for health maintenance and quality of life. The data presented in this study confirm the results of other studies which also indicate poor nutrient consumption by institutionalized elderly. Studies show that elderly in LTC consume below the nutrition recommendations (Gloth III et al., 1996; Johnson et al., 1995; Lasheras et al., 1999; Lipski, Torrance, Kelly, & James, 1993; Lowik et al., 1992; Nguyen et al., 1985; Rudman, Abbasi, Isaacson, & Karpiuk, 1995; Sahyoun et al., 1988; van der Wielen et al., 1996) . However, the number of inadequate nutrients mentioned by these dietary intake studies were less than those in our study. These differences may be attributed to the method used to assess dietary intakes and the use of the current nutrient recommendations (DRIs).

Methods used to measure dietary intakes of institutionalized elderly take on a variety of forms, however, current approaches vary based on the research situation and are not always appropriate for the LTC setting. Our study found that

the observation method of dietary assessment gave valid results compared to the weighed method. It captured more foods consumed by subjects than did the weighed method (i.e., beverages poured in the dining area, foods traded among table mates, spillage, second helpings of foods). The primary researcher's estimation ability was tested to ensure that the data collected was accurate as the accuracy of this method relies on individuals trained in food observation and estimation. Therefore, the observation method may be considered a simple and valid method for determining the quantity of macronutrients, vitamins, minerals, and dietary fibre consumed in institutionalized care.

The high proportion of individuals in this study not meeting the current nutrient recommendations may be attributed to the standards of comparison. Previous studies assessing dietary intakes used the RNI (Health and Welfare Canada, 1990) or the RDA (National Research Council, 1989) as comparisons. There were no guidelines as to how to assess dietary intakes using the previous RNIs and RDAs, however, with the introduction of the DRIs, the EAR is used as the value of comparison (Institute of Medicine, 2000b). We observed a wide range in prevalence of inadequacy for the micronutrients assessed using the EAR cut-point method, thus we may have overestimated or underestimated the prevalence of inadequacy depending on the nutrient. According to the Institute of Medicine (2000b), the EAR cut-point method works effectively when the variance of individual intakes is greater than the variance of individual requirements (Institute of Medicine, 2000b). This assumption may not have been met in this study for some nutrients. Iron is the known exception as we used a probability analysis. Furthermore, in institutional settings, exemplified by this study, it is possible that the variation in dietary requirements exceed the variation of dietary intake due to the use of a standardized menu. However, a large variation in dietary intake was achieved by assessing the 48 residents in 5 different LTC facilities over a seven month period.

The prevalence of inadequacy for folate was high at 96% for male and

female subjects. Folate intake may have been higher if the values were adjusted to reflect the changes made to the Canadian folate fortification policy in November 1998. Folate fortification was made mandatory at a level of 0.15 mg of folic acid per 100 g of white flour and 0.27 mg per 100 g of enriched pasta (Health Canada, 1998). Folate levels in this research were not adjusted. This study began in January 1999, therefore, folate fortification may not have reached the food supply at that time.

With the understanding that residents do not consume the amount of nutrients that is recommended nor provided, foods provided in between meals becomes critical. However, Table 5.8 indicates that even though snacks were provided the nutrient content of intakes (meals and snacks) remain below the nutrient content of the meals only. Therefore, other avenues of increasing the nutrient content of food is warranted such as supplementation of various vitamins and minerals into food items/meals (e.g., vitamin D and calcium) or making foods more nutrient dense. It is important to note that the nutrient density of the snacks consumed may not have been accurate due to confounding factors. We were unable to distinguish whether the LTC residents (1) were offered snacks, (2) refused snacks, (3) offered snacks, but did not eat them, or (4) that nutrition representatives did not record the consumption of snacks accurately. Further research is needed with regards to snack intake and food supplementation among elderly LTC residents.

5.5 Conclusion

Maintaining the nutritional well-being of elderly residing in LTC facilities is of prime importance. Our study confirms that elderly in LTC continue to consume an inadequate amount of nutrients even with the consumption of food between meals. It is critical that foods offered via a menu cycle represent a wide variety of food items from the four basic food groups and be nutrient dense to ensure

residents consume an adequate balance of nutrients.

Diets of elderly LTC residents should be monitored on a regular basis using dietary assessment techniques that are shown to be appropriate for an elderly institutionalized population. These methods should be accurate and labor non-intensive so that they can be performed frequently. On-going dietary assessment of older adults in a LTC population may help detect nutritional problems, prevent further nutrition related problems, and aid in follow-up of medical conditions/nutritional problems. In this study, the observation method was found to be a more valid tool of measurement compared to the weighed method. However, before this tool can be used, health care personnel need to be sufficiently trained in estimating food quantities and consumption of food portions by elderly persons.

CHAPTER 6

FOOD SERVICE SATISFACTION OF ELDERLY RESIDENTS IN LONG-TERM CARE FACILITIES IN A HEALTH DISTRICT IN SASKATCHEWAN

6.1 Introduction

Eating is considered one of the most important aspects of daily life for elderly residents residing in long-term care (LTC) facilities (Position of the American Dietetic Association, 2000; Sherwood, 1973). Mealtime enjoyment and nutritional well-being contribute to improved health status and quality of life. The consequence of inadequate nutrition is malnutrition, and subsequent morbidity and mortality.

Quality of life has become a critically important concept in health care in recent years (Mitchell & Kemp, 2000). Its definition refers to the assessment of subjective importance and perceived availability of *autonomy* (i.e., individuality, physical independence, control over environment, and the ability to take part in appropriate and meaningful activities), *interpersonal relations* (i.e., interaction level, friendship, staff relations, expression, and respect), and *security* (i.e., physical safety and comfort, order and structure, and the provision of needed care) in a long-term environment (Grossman & Weiner, 1980). In LTC, residents seek control (Forbes, Jackson & Kraus, 1987) and choice over their lives (Pratt, 1999). They also desire to live in an environment that promotes safety, security and meaningful relationships that enhance their residential experience. In 1996, Saskatoon District Health (SDH), a health district in Saskatchewan, developed *Standards For Quality of Life, Long-Term Care Division* (Saskatoon District Health, 1996). These standards address the residents' need and right to receive competent care in a safe environment, and to exercise personal choice in their

plan of care, including the right to make informed choices.

Food and eating are critical components in LTC facilities and may impact on the overall quality of life of its residents. Food intake and quality of life may be influenced by residents' perceived satisfaction of the meals and food services provided to them.

Research has shown that decreased food intake among LTC residents may be influenced by the monotony of institutionalized food, the failure of food service staff to recognize cultural and geographic food preferences, and plate presentation (Chambers, 1996; Morley, 1997). Food intakes also may be affected by staffing levels and training.

To assess products and services provided to consumers, satisfaction surveys have been routinely administered (Owens & Batchelor, 1996; Scott & Smith, 1994). These surveys have been conducted in hospital settings to monitor patient care (Dube, Trudeau & Belanger, 1994; Ehnfors & Smedby, 1993), and have been used less often to exclusively assess food service satisfaction (Dube, Trudeau & Belanger, 1994). When food service satisfaction surveys are conducted they typically exclude subjects older than 65 years of age because of the presumption that it can be difficult to select a cognitively non-impaired sample and/or administer face-to-face or written surveys with the elderly (Simmons, Schnelle, Uman, Kulvicki, Lee & Ouslander, 1997). Moreover, studies assessing food service satisfaction and quality of life of elderly in LTC facilities are needed in the wake of the burgeoning elderly population entering specialized care settings (Amarantos, Martinez & Dwyer, 2001).

Dissatisfaction with food services provided by LTC facilities may influence an individual's dietary intake and perceived quality of life. The objectives of this study were to assess the satisfaction of elderly (≥ 65 years of age) residents with the meals and food services they receive in their LTC facilities, and quality of life issues related to eating.

6.2 Methods

6.2.1 Study Population

The eighteen LTC facilities from Saskatoon District Health comprised the study population. A demographic survey was developed to gather information about residents, 65 years of age and older, residing in the LTC facilities. Food service representatives (i.e., food service supervisors, cooks, support service directors, and dietary staff) from each LTC facility were asked to provide the following information on their elderly residents: name; sex; room location; year of birth; and diet order. The type of meal time assistance required for each resident was requested using an adapted version of the Functional Independence Measure (FIM) (Research Foundation - State University of New York, 1990). Food service representatives also were asked to indicate whether residents would be able to be interviewed. Residents were eligible to participate in the interview if they met the following selection criteria: 1) 65 years of age and older; 2) cognitively able to answer simple, easy to understand questions, verbally or nonverbally, as determined by the food service representatives of each LTC facility; and 3) residing in the facility for at least two months.

The initial survey was pilot tested in two LTC facilities to clarify wording discrepancies, problems with sentence structure, and content. As few problems were found, these facilities were not retested. Of the 16 remaining facilities, one declined to participate prior to the mailing of the survey, and three did not complete the mailed out survey. In total, 14 facility questionnaires were returned (82% participation rate) between the months of October 1997 and March 1998, but one facility later declined to participate in the resident interviews. Three hundred and forty-nine residents from the 13 participating LTC facilities were identified as potential participants from a resident pool of 982.

6.2.2 Ethical Approval

Ethical approval was obtained from the University of Saskatchewan Advisory Committee on Ethics in Human Experimentation, and site specific ethics committees where they existed. Residents participating in the survey were required to sign a consent form prior to involvement in the study. The consent form was written in nontechnical language and was presented in large print. Confidentiality was assured by using randomly selected numeric codes for each participant.

6.2.3 Questionnaire Development

The selection of items and domains chosen for the questionnaire were initially based on a literature search of previously conducted food service satisfaction surveys (Dube, Trudeau & Belanger, 1994; O'Hara, Harper, Kangas, Dubeau, Borsutzky & Lemire, 1997) and patient satisfaction surveys (Forgan Morle, 1984; Zinn, Lavizzo-Mourey & Taylor, 1993). A group of residents from a randomly selected LTC facility was then used to generate the initial item pool. The purpose of the group was to gather information from elderly residents on possible food service questions or issues to address in the food service satisfaction questionnaire. At the monthly residents' council meeting at the selected LTC facility, the researcher and a volunteer informed the residents about the forthcoming questionnaire and requested their input on food service questions or issues. Participants were asked to identify issues related to food and food services (i.e., meal temperature, quantity of food, variety of foods). Factors which related to quality of life standards (i.e., general access to food, flexibility in timing of meals, food choices, choice in therapeutic diet, family involvement) also were explored. The entire discussion was prompted by semi-structured and open-ended questions. The Director of Foodservices, approximately 50 elderly residents, three relatives of the residents, and employees from departments such as nursing, food services, and recreation attended. A wide range of responses were given such as the quantity and the variety of meals and snacks, promptness of meal delivery, and dining room eating arrangements. These comments were recorded and incorporated into the questionnaire. Prior to instrument

administration, the questions were reviewed by an expert panel in the fields of food services, nutrition, and gerontology.

The questions selected for the questionnaire were based on two domains: quality of life and food services. The quality of life domain was further subdivided into *autonomy*, *interpersonal relations*, and *security*. Two versions of the questionnaire were pretested. The initial questionnaire contained 24 declarative statements, using a 5-point Likert-type format (i.e., strongly disagree to strongly agree). This questionnaire was pilot tested with 22 residents in one LTC facility (55% completion rate). It was observed during the pilot study that the scale was too difficult for the residents to interpret and thus, was burdensome for both the interviewer and the interviewee. The original survey took an average of 45 minutes to complete and the residents' ability to answer questions diminished after item 18. To correct these problems, the statements were rephrased into questions and the response scale was changed to a 3-point format (i.e., yes, sometimes, no). This questionnaire was then pilot tested on 22 residents at a different LTC facility (73% completion rate). This version of the questionnaire took less time (20-30 minutes) to conduct and was better accepted and understood by the participants. These 28 pilot study subjects were excluded from further analysis.

The final version of the questionnaire included 25 questions using the tested 3-point scale. Fifteen questions dealt with the quality of life determinants, autonomy (n=7), security (n=5), and interpersonal relations (n=3), while the remaining questions pertained to food services. To measure the instrument's reliability, a test-retest was conducted with 21 randomly selected subjects from a different LTC facility within 2 weeks of the initial interview.

6.2.4 Questionnaire Administration

The questionnaire was administered face-to-face by nine trained interviewers (5 paid and 4 unpaid volunteers). All of the interviewers were required to attend a 1 hour interviewer skills workshop to learn how to communicate effectively with the elderly. Topics discussed were: speaking and listening, interviewing etiquette, and handling

difficult situations. The importance of establishing rapport with the subjects was emphasized. An interviewing training manual was developed to supplement the workshop. Volunteers practiced their interviewing skills by conducting mock interviews. The interviews were evaluated by their peers and suggestions for improvement were provided.

The trained volunteers and the researcher administered the questionnaires. A list of all eligible participants, based on the demographic survey, were listed, numerically coded, and randomly assigned to each interviewer. The lists provided the name of each resident, sex, room location, language preference, and information on hearing or visual impairments. Extra columns were available to indicate participation, call backs, date of survey, and the interviewer's name. Prior to conducting the survey, a newsletter article written to inform residents, their families, and employees about the resident food service survey was provided to the LTC facilities. The facilities were requested to submit the article in their monthly newsletter prior to the survey commencement.

6.2.5 Data Analysis

Data from 205 returned questionnaires were compiled and statistically analyzed using the statistical analysis program SPSS (Statistical Package for Social Sciences) release 8.1 for Windows (SPSS Inc., Chicago, IL). For the statistical analysis, the three response alternatives (i.e., yes, sometimes, no) were recoded into two categories: positive and not-positive responses. The positive category represented the "yes" responses, while the not-positive included "sometimes" and "no" responses. The upper two centiles were used as the cut off, thus questions with less than 80% of positive responses were deemed less than satisfactory. Frequencies were used to summarize the results of the questionnaire. Cumulative positive scores (number of "yes" responses) were found for each domain for each resident and the relationship between the domains was determined using a Pearson's correlation.

Two methods were used to examine instrument reliability, test-retest reliability and internal consistency. Test-retest reliability was measured using a paired samples t-test using 21 subjects. Internal consistency (Cronbach's Alpha) was used to determine the homogeneity of items in each domain.

6.3 Results

6.3.1 Descriptive Statistics

Two hundred and thirty-three residents were interviewed (67% participation rate). In the analysis of data the 28 pilot group subjects were not included as they did not complete the final questionnaire, leaving 205 subjects (Table 6.1). The mean age of the subjects was 83.3 ± 7.9 years. The reasons for nonparticipation from subjects were health concerns and disinterest.

6.3.2 Instrument Reliability

Twenty-three of 25 questions were shown to be reliable ($p > 0.05$). The two questions eliminated from the analyses were from the quality of life domain: 1) Do you get the help you need during mealtimes? (Security; $p = 0.041$); 2) Are you able to choose some of the food items that you eat at meals? (Autonomy; $p = 0.049$). The internal consistency for food service and quality of life domains were $\alpha = 0.62$ and $\alpha = 0.60$, respectively when excluding the two unreliable questions, which are acceptable in exploratory research (Robinson, Shaver & Wrightsman, 1991).

6.3.3 Food Service Satisfaction

Table 6.2 describes the food service items scoring 80% or more of the positive responses. Table 6.3 provides the food service items scoring less than 80% of the positive responses. Food service issues that arose were related to the posting of menus before meal service, types of foods served, food temperature (hot), the palatability of the food, food appearance, and food variety.

6.3.4 Quality of Life Issues Related to Eating

Table 6.4 describes the quality of life items scoring 80% or more of the positive responses. Table 6.5 provides the quality of life items scoring less than 80% of the positive responses. Potential concerns for quality of life issues were food choice, the

Table 6.1. Resident food service satisfaction participant characteristics (n=205).

Characteristics	Frequency ^a	Percentage of Total
Sex		
Male	79	38
Female	126	62
Age (y)		
60 - 69	13	6
70 - 79	40	20
80 - 89	107	52
90 - 99	42	21
≥100	2	1
Diet order - Therapeutic		
Regular	119	59
Diabetic	36	18
Low Sodium	13	7
Reducing/Low Calorie	8	4
High Fibre	4	2
Low fat	3	1
Diabetic and Low Sodium	3	1
High Protein	2	1
Vegetarian	2	1
Others (16 types)	13	6
Diet Order - Texture Type		
Regular	143	70
Ground/dental/soft/minced	32	16
Cut-up	21	10
Pureed/blenderized	7	3
Others (2 types)	1	1
Meal Assistance		
Complete independence	115	57
Modified independence	30	15
Supervision or set-up	49	24
Moderate assistance	7	3
Total assistance	2	1

a. Some demographic data were not available (one age; two diet orders, and two meal assistance), therefore not all categories add up to 205.

Table 6.2. Food service items with 80% or more positive (Yes) responses (n=205).

Food Service Item	Yes	Sometimes	No
Are your meals served on time?	81	11	8
Do you like the foods that are served for holidays or special occasions?	87	11	2
Are you satisfied with the amount of food given to you?	92	5	3
Is the cold food cold?	92	5	3
Are you happy with the service you receive at mealtimes?	94	4	2

Table 6.3. Food service items with less than 80% positive (Yes) responses (n=205).

Food Service Item	Yes	Sometimes	No
Do you know ahead of time what foods will be served at meals by a menu board, staff, or a menu?	64	6	30
Do you like the types of foods that are served?	70	26	4
Is the food served to you tasty?	75	18	7
Is the hot food hot?	75	19	6
Does the food look appealing?	77	19	4
Is there a wide assortment of foods served to you?	79	8	13

Table 6.4. Quality of life items with 80% or more positive (Yes) responses (n=205).

Quality of Life Item	Yes	Sometimes	No
Are you satisfied with the meals that you receive? (Autonomy) ^a	82	12	6
Would you like to have more choice in whom you eat with? ^b (Autonomy)	15	4	81
If you had any concerns or problems about the food would they be taken seriously by staff? (Interpersonal Relations)	87	2	11
Do you enjoy mealtimes? (Autonomy)	89	8	3
Do you feel free to express your concerns or complaints about the food given to you? (Interpersonal Relations)	89	2	9
Do you like where you eat your meals? (Security)	94	3	3
Do you like the times meals are served? (Security)	95	3	2
Is the staff that serve your meals friendly? (Interpersonal Relations)	95	4	1
Are you given enough time to eat? (Security)	96	2	2
Is the place where you eat your meals kept clean? (Security)	100	0	0

a. Words in parenthesis represent quality of life categories.

b. Positive answer implies a dissatisfaction and was recorded as a “yes”.

Table 6.5. Quality of life items with less than 80% positive (Yes) responses (n=205).

Quality of Life Item	Yes	Sometimes	No
Would you like to be given more choice in what you eat? ^a (Autonomy) ^b	30	8	62
Can you have a snack when you want to? (Autonomy)	73	6	21
Are different meals served for holidays or special occasions? (Autonomy)	79	10	11

a. Positive answer implies a dissatisfaction and was recorded as a “yes”.

b. Quality of life determinant category. availability and accessibility of snacks, and the variety of meals served for holidays.

6.3.5 Positive Responses to Food Service and Quality of Life Domains

Total positive responses in each of the two domains were: food services (8.6 ± 2.1), out of a possible 11 questions; and quality of life (9.9 ± 1.5), out of a possible 13 questions. Scores from the food services and quality of life domains were positively correlated ($r = 0.451$, $p < 0.001$, $n=201$) indicating that high scores on food services were associated with high scores on quality of life.

6.4 Discussion

The objective of this study was to examine food service satisfaction of elderly residents in LTC facilities with the inclusion of quality of life components. In the LTC setting, it is recognized that quality of life is important to the older adult as freedom of choice and control over one's care and environment is limited (Volicer & Bloom-Charette, 1999). Health care providers have made progress in making the LTC environment as home-like as possible (Mitchell & Kemp, 2000) (i.e., dining room style food service vs tray service; serving breakfast between a range of times to accommodate different lifestyles; providing private rooms and bathrooms) for the purposes of maintaining and promoting individuality, independence, comfort, and valuable relationships. However, providing quality nutritional care is complex and involves the understanding of elderly residents' food preferences, likes, dislikes, and nutritional needs.

We developed a food service satisfaction survey to use in LTC facilities with cognitively non-impaired elderly. The results indicate that residents were satisfied with food services provided and quality of life issues associated with eating. In the food services domain, residents were satisfied with the timing of their meals, the variety of foods served for special occasions, the amount of food served, the temperature of the cold food, and the service received at mealtimes. Within the quality of life domain, residents were satisfied with the location of their meals and the cleanliness of the dining area, the times meals were served, the friendliness of the food service staff, and the amount of time given to eat. Residents were also content with the individuals with whom they ate, the meals that were served, how food service issues are handled, and the ability to express their concerns about the food to staff. Within both of the food services and

quality of life categories, residents did exhibit some dissatisfaction. Low positive responses were associated with food quality, variety, taste, and appearance. Questions that addressed the issues such as food choice and obtaining food between meals also were given low positive responses.

The instrument addressed the three common quality of life determinants, *autonomy*, *security*, and *interpersonal relations*, in relation to food, eating, and food service delivery. Residents were satisfied about all of the questions pertaining to security and interpersonal relations in the LTC facilities. However, in the autonomy arena issues regarding lack of food choice and independence or control over snack accessibility were acknowledged as concerns. Autonomy in LTC institutions is an important concern of residents (Pratt, 1999). As newly admitted residents tend to lose some independence and control over their daily lives, efforts must be made to provide care which emphasizes autonomy (Forbes, Jackson & Kraus, 1987).

The results of this study were similar to those of other studies examining food service satisfaction among elderly LTC residents. O'Hara and colleagues (1997) interviewed female (60%) and male (40%) LTC residents (n=65), with a mean age of 67 years, to identify food, service, and patient variables associated with high food service satisfaction. Subjects in this study were found to be satisfied with both the quality and quantity of food and food services provided. In another study examining overall nursing home satisfaction (Zinn, Lavizzo-Mourey, & Taylor, 1993), female (80%) and male (20%) residents (n=168), with a mean age of 82, were asked 11 questions about services provided by the nursing home (i.e., physician, nursing, and other services such as food services, housekeeping). The only question that addressed food services made reference to mealtime enjoyment (i.e., presentation, service, choices, and taste). Of a 4-point Likert scale (not so good, ok, good, very good), residents' mean score was 2.76 ± 1.05 (SD), which indicated that their level of satisfaction was between ok and good.

Our results show a high level of food service satisfaction among residents in LTC facilities. Previous research has shown that elderly residents in LTC centres typically rate services provided to them highly (Owens & Batchelor, 1996). Satisfaction surveys among this population generally present positive results in part because the elderly are

less likely to complain, are unaware of the appropriate level of service, are fearful of reprisals that may occur in response to their comments, or are just grateful for any services they receive (Kane, 1998). The raw scores could be confounded by positive response bias, therefore, we used the upper two centiles or 80% of 100% as the cutoff. To minimize positive response bias, strict protocols were given to interviewers during their training sessions emphasizing the importance of establishing rapport with each participant and maintaining that relationship throughout the interviewing process. As a result, we feel that the survey process was able to obtain responses that were an accurate representation of participants' views.

Determining food service satisfaction among LTC residents is complex. In assessing satisfaction of services, whether it is food services or patient services, there must be a recognition that many factors coexist that may influence the perceptions of individuals (Mutran, Sudha, Desai & Long, 2001). Satisfaction of food services may be influenced by indirect factors such as one's health, dependency, resident involvement in LTC placement decisions, LTC atmosphere, staff involvement, ethnicity of resident or LTC facility, and resident's personal experiences (Mutran, Sudha, Desai & Long, 2001). Our study did not examine the influence of any outside factors on resident food service satisfaction. Further research is needed to examine the impact of these factors on satisfaction.

Some food service delivery recommendations in LTC facilities may be generated from this study. A recommendation would be to increase residents' meal choices and control over decisions regarding their eating environment. As many residents were not aware of their food choices, the presentation of menu items should be enhanced by visual aids (e.g., clear, large print on dry erase boards) and oral communication (e.g., foods offered before the designated meal). Since residents also displayed concern over the amount of food choices offered and the variety of foods served at meals, a wider selection of food choices should be incorporated into a menu cycle. This could be accomplished by offering a meal, weekly or biweekly, that has been chosen by a randomly selected resident (i.e., Resident's Choice); special meals to celebrate residents' birthdays; a choice between a cold and hot entree; and/or a variety of beverages at each meal.

Long-term care facilities need to become more aware of how to enhance the meal time experience for the elderly resident. However, this task may only be accomplished by careful assessment of food service satisfaction. This study contributes to the development of a reliable tool to assess food service satisfaction in relation to food services and quality of life in LTC facilities. While the tool may only be used with cognitively non-impaired LTC residents who share the same characteristics as those subjects in this study, it captured the perceptions of elderly individuals including the oldest-old (i.e., 85 years of age and older), which is the fastest growing section of the senior population (Statistics Canada, 1999).

CHAPTER 7

GENERAL DISCUSSION

7.1 Overview of Research

The purpose of this research was to evaluate food services provided to the elderly residing in LTC facilities in Saskatoon District Health. This research study was accomplished in four phases: 1) Menu Analysis; 2) Resident Food Service Satisfaction; 3) Food Service Practices; and 4) Dietary Intakes of the Elderly. Each phase was incorporated into one of the six components present in Vaden's food service systems model (1980) as discussed in Chapter 3 (Figure 3.1). In Chapter 1, three hypotheses and seven objectives of the research study were identified. In the next seven sections, a brief summary of the results of each of the four study phases will be discussed in relation to the specific hypotheses tested.

7.1.1 Objective 1: Determine Current Menu Planning Practices

Menu planning practices currently used by LTC facilities were examined. Through their food service delivery systems, LTC facilities strive to provide a variety of meals and snacks that are nutritious. Feedback from residents, their families, and staff was used as input regarding the ability of the system to provide for residents' nutritional needs. Results from this study show that food service staff refer to published guidelines for developing menus that are appropriate in terms of nutritional quality, content, and variety. Regular supplementation of nutrition, through scheduled between meal snacks, was not uniformly practiced. However, when snacks were provided they were appropriate to residents' medical and dietary needs. LTC facilities that provided snacks

routinely made them available to residents 24 hours/day via a kitchenette or personal request.

7.1.2 Objective 2: Evaluate the Nutritional Adequacy of Non-therapeutic Menus

Non-therapeutic menus were analyzed for nutrient content and food variety based on the DRIs (Institute of Medicine, 1997, 1998, 2000a) and Canada's Food Guide to Healthy Eating (Health and Welfare Canada, 1990). It was hypothesized that the meals given to residents would be adequate in nutrients and variety. The results indicate that residents' meals were low in important nutrients and appropriate nutrient dense foods. The typical food values of daily meals did not meet the nutrient recommendations for many nutrients, including vitamin E, vitamin C, niacin, vitamin B₆, folate, magnesium, zinc, calcium, and vitamin D for either males or females. Energy was below recommended levels for males. Fibre content also was below the suggested daily intake (World Health Organization, 1990). Finally, the menus did not meet the recommended Canada's Food Guide to Healthy Eating servings for grain products, and vegetables and fruit, even though LTC food service representatives report that they refer to Canada's Food Guide to Healthy Eating to plan menus. The food items that LTC facilities provided to their residents between meals were nutrient dense, encompassed the four food groups, and were generally good food choices. But as noted in the practices survey (Objective 1), not all LTC facilities provided snacks to their residents. Findings from this objective do not support the hypothesis (Hypothesis 1) that LTC facilities provide an adequate amount and variety of nutrient dense foods to meet the nutritional needs of their elderly residents.

7.1.3 Objective 3: Determine the Most Appropriate Dietary Assessment Method to Obtain Dietary Intakes of LTC Elderly

The observation method and the weighed method were both used to determine dietary intakes. It was hypothesized that the observation method would provide as valid a measure of dietary intakes as the weighed method. Comparisons of the results of the

use of the two methods confirmed this assertion. Moreover, the observation method when used in uncontrolled eating situations may be a better method. As found in this study, observation “captured” dietary intake not present on residents’ own plates (e.g., ate food from their dining neighbor’s plate). Food not served (and weighed) on residents’ plates is missed by the weighed method. Results support the hypothesis (Hypothesis 3) that the observation method is a reliable and valid tool for measuring dietary intakes of institutionalized elderly.

7.1.4 Objective 4: Determine if LTC Elderly Residents Consume Adequate Supply of Nutrients

Dietary intakes of residents on non-therapeutic menus were analyzed for nutritional adequacy based on the DRIs (Institute of Medicine, 1997, 1998, 2000a). It was hypothesized that the elderly residents would be consuming adequate amounts of energy, macronutrients, vitamins, minerals, and dietary fibre. Instead, the results showed that the residents were nutritionally deficient and at risk for inadequate intakes of folate, magnesium, zinc, vitamin E, vitamin B₆, vitamin C, niacin, thiamin, vitamin B₁₂, calcium, vitamin D, and overall energy. Snacks were not included in these dietary intakes as the practice of providing snacks to LTC residents was not consistent in every facility (Objective 1). Snack intake may have increased the energy and nutritional intake of residents, assuming that all residents are provided nutritious foods and consume the appropriate portions and types of foods offered. The findings produced by this objective do not support the hypothesis (Hypothesis 2) that the elderly residing in SDH LTC facilities consume an adequate supply of energy, macronutrients, vitamins, minerals, and dietary fibre.

7.1.5 Objective 5: To Measure Food Service Satisfaction of Elderly LTC Residents

Residents were satisfied with the timing of their meals, the variety of foods served for special occasions, the amount of food served, the temperature of the cold food, and

the service received during mealtimes. However, there were notable percentages of subjects who reported dissatisfaction with food quality, variety, taste, and appearance. All of these areas of concern could heavily impact on food consumption among LTC residents (Objective 4). These items are directly related to the sensory perceptions of taste, touch, sight, and smell. Since food selection is based primarily on these senses, less intake of food, thus energy and nutrients, may lead to poor nutritional status. Due to the fact that physiological changes occur as one ages, the effect could be greater as elderly have been shown to have decreased appetite, satiety, taste, and smell thresholds (Marcus & Berry, 1998), thereby altering their food preferences and appetite.

7.1.6 Objective 6: To Measure Food Service Satisfaction of Elderly LTC Residents in Relation to Quality of Life Issues

Residents were content about the location of their meals, the cleanliness of the dining area, the timing of meals, the friendliness of the food service employees, and the amount of time given to eat. Residents also were pleased with their table mates, the meals served, how food service issues are handled, and the ability to express concerns freely to employees. Concerns were noted regarding food choice and snack delivery, which could also impact on food consumption (Objective 4), and menu planning practices (Objective 1).

7.1.7 Objective 7: To Understand Interactions that Influence Food Consumption in a LTC Food Service Delivery System

Food service delivery is the result of a synergistic relationship between many factors. To model this relationship, the Vaden's food service systems model (1980) was modified to explain the interrelationship between phases 1 - 4 (Figure 3.1) in understanding the role that internal and external factors play in influencing food intake and the quality of life of elderly LTC residents.

7.2 Model for Food Consumption and Quality of Life

Food service delivery provided to LTC residents is complex and involves many aspects. Together, the four phases of the research study demonstrate that a variety of factors influence food consumption and quality of life among elderly LTC residents. To understand this process, the food service systems model developed by Vaden (1980) was applied. With the changing healthcare system and the use of new health promotion terminology, this model may be out-dated. In essence, the Vaden model was modified to provide a better understanding of the four study components and how food service components are interrelated.

The ROCIE Food Service Systems Model (Figure 7.1) was constructed as a result of the research findings to understand how the studies relate to one another. The proposed model, referred to as ROCIE, stands for Resources, Outcomes, Controls, Indicators, and Environmental. The model reinforces the understanding that a food service system continually interacts with its environment. Therefore, it is viewed as a whole entity rather than the accumulation of individual parts. The ROCIE model is a modernized version of the Vaden model (1980) in terms of language and purpose. The model illustrates the dynamic relationship that exists between all of the external and internal components of a LTC food service system and provides insight into how food services in LTC facilities operate and also may be used in other food service operations.

The ROCIE model consists of the following six components: Resources, transformation, Outcomes, Controlling factors, potential change Indicators and the Environment, which are required to produce an effective and efficient food services system. Resources refer to the necessary elements needed to produce quality food service delivery and nutritional care. These elements include human labor and skills (e.g., registered dietitians), financial resources, food, supplies, and operational space (facility design and utilities). In order to produce a desired outcome, the resources require transformation. The transformation component is inherent to the model as this is the stage that drives the model's processes. It consists of managerial functions that work

interdependently at all levels of the food service operation such as food procurement, production, distribution, sanitation, and safety. At this stage, the entire process is enhanced with the use of computerized systems that make menu planning efficient based on the needs of the specific resident population. Computerized systems aid in menu planning, recipe production, product forecasting, food production, analyzing trends, and menu changes. Transformation leads to outcomes. Outcomes are the products and services that are developed as a result of the transformation stage which expresses the goals and objectives of the food service organization. Nutrition and food service related outcomes developed from this research were residents' quality of life, food consumption, and nutritional analysis of menus. In order to produce desired outcomes that coincide with the organizations goals, controlling factors must be in place. Controlling factors of a system include standards, policies and procedures, and programs of a food service organization. In this study the factors were: the type of food service delivery system; staffing requirements, policies and procedures; food and nutrition service standards, philosophies and policies; resident demographics, and the menu. To link all of the components together and maintain the dynamic nature of the model, a feedback mechanism is needed. Potential change indicators are critical to this model as they provide information about the effectiveness of the entire food service system in terms of evaluation and control. A food service satisfaction survey was used in this research to evaluate the quality of the food and food services delivered LTC elderly residents. Furthermore, each component is affected by the environmental context. These factors include physiological changes due to aging, personal beliefs and perceptions, food experiences, medical conditions, medication usage, and the environment in which the system operates (e.g., LTC facility vs a full service restaurant). Ultimately, the main emphasis of this framework is food consumption and quality of life. The interactions that may occur as a result of the model may affect resident food consumption and their quality of life either negatively or positively. For example, when food service delivery is unsatisfactory, food consumption may decrease, and thus, may make LTC residents susceptible to adverse health effects. Therefore, the feedback loop is an important

control mechanism for the model.

Food service delivery to elderly LTC residents is challenging and will become even more dramatic as the baby boomers (those born between the mid-1940's and the early-1960's) require institutional care. This cohort are believers of self-fulfilment and idealism, have distinctive cultural and religious backgrounds, and were raised in a time of economic expansion (Adams, 1997). This group comes from an affluent era, where they have had immediate access to a multitude of resources, and will continue to yearn for the same standard of life to which they have been accustomed. In contrast, the current elderly population (individuals born prior to the early 1930's) grew up in a society with distinct male and female roles. They witnessed technological advancement in areas such as transportation, communication, and entertainment (Adams, 1997). The elderly of today are accustomed to eating basic meals which reflect their formative years, whereas baby boomers' food preferences and food service expectations are more diverse expand over a variety of cultures. Therefore, the ROCIE Food Service Systems Model may be able to assist health care professionals in understanding the factors that affect food service outcomes in a LTC environment and in other food service operations.

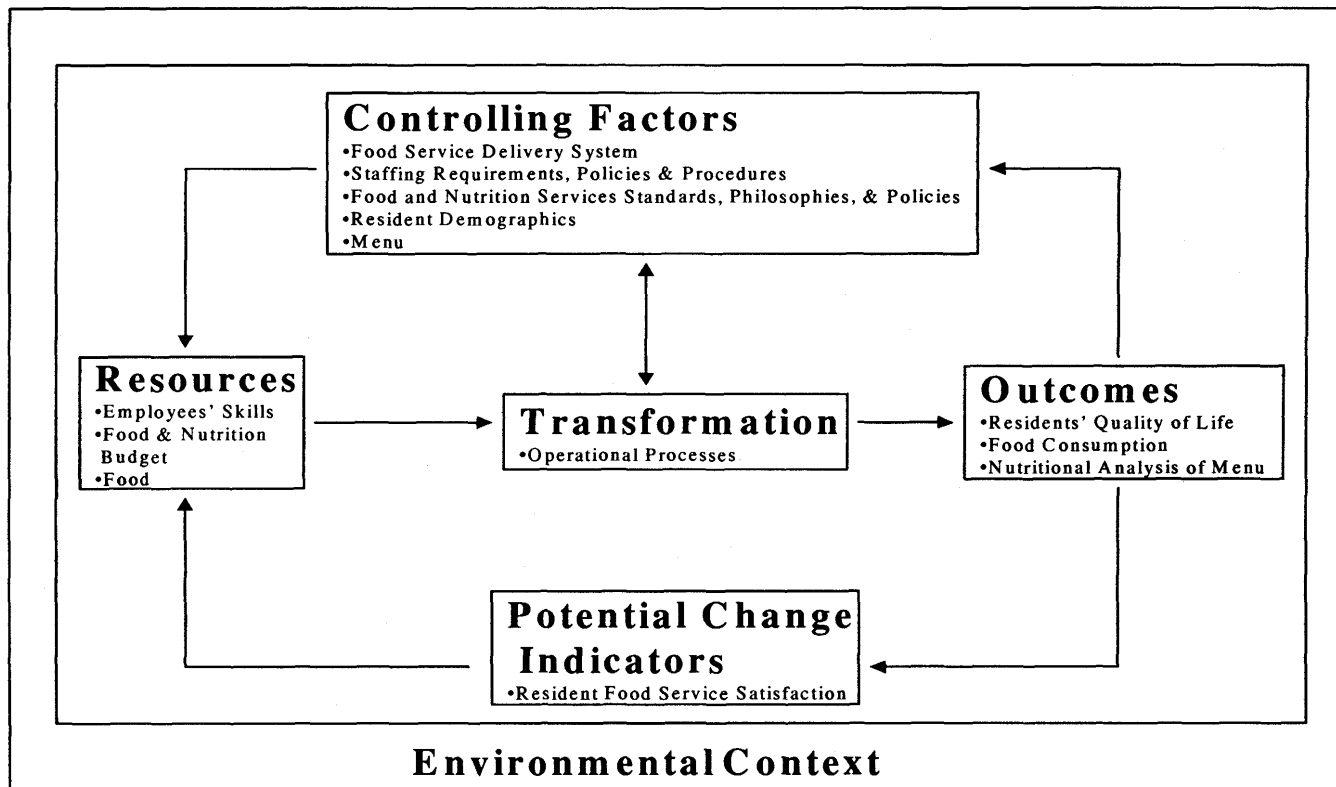


Figure 7.1. ROCIE food service systems model (Adapted from Vaden, 1980).

7.3 Limitations

Limitations exist for each of the four research phases. Recognizing these areas are important to improve future studies.

7.3.1 Phase 1: Menu Analysis

Menu analysis was only performed on regular, non-therapeutic menus. LTC residents require a variety of texture modified diets (i.e., pureed) and therapeutic diets (i.e., diabetic). Therefore, it would be important to ensure that residents on specialized diets receive adequate nutrition.

Menu information given by the food service representatives were in some cases subjectively determined. The portion sizes of some menu items and their accompanying recipes were not always consistent or accurate. In some LTC facilities, food portion sizes and recipes varied when different cooks prepared the meals. Portion sizes were individualized based on the resident's requests and nutritional needs in the LTC facilities and were difficult to quantify with a survey alone. The nutritional analysis software, Nutritionist IV, as with any program, has limitations such as missing nutrients, lack of imputed values, and an incomplete list of food items.

7.3.2 Phase 2: Resident Food Service Satisfaction

The results in the survey are only generalizable to residents of LTC facilities who are cognitively non-impaired. The survey population was determined by the food service representatives as cognitively able to answer simple questions, but they were not tested for their level of cognitive impairment using mental status assessment instruments (e.g., Folstein Mini-Mental Examination; Short Portable Mental Status Questionnaire). Of the 980 residents in the 13 LTC facilities, only 349 (36%) were determined to be cognitively non-impaired and thus, eligible to participate in the study. Therefore, the participant sample may not be representative of the entire LTC population.

Even though the subject responses to the food service and quality of life questions were generally positive, they were not tested for level of importance. Questionnaire

reliability was found to be adequate, however, test-retest was conducted on a small sample, which may not generalize to the entire participant sample. Positive response bias also may have been present as elderly residents may have feared repercussions from LTC staff if they gave negative responses. To conduct the interviews, nine trained interviewers were used. Even though they were trained consistently, they may have introduced their own individual bias. In addition, some of the survey responses were difficult to analyze and interpret due to the response scale used.

7.3.3 Phase 3: Food Service Practices

The food practices survey was used to identify current food service practices. The menu planning practices examined via the survey did not differentiate snack delivery among therapeutic and non-therapeutic diets. As a result of this survey design, we were unsure whether elderly LTC residents consuming non-therapeutic diets were offered snacks, thus influencing their overall nutrient consumption.

7.3.4 Phase 4: Dietary Intakes

In order to collect information regarding dietary intakes of LTC elderly residents, food service representatives were requested to select a random sample. However, it was recognized that some of these subjects may have been drawn from a non-random, convenient sample in order to minimize any problems or delays with food service delivery to LTC residents.

Collecting dietary intakes was challenging. It was difficult to weigh leftover food items that were either mixed with food items or absorbed adjacent liquids (e.g., cereal and milk). Dietary intakes did not include those residents on pureed or on therapeutic diets. It would be important to ensure residents on specialized diets are consuming sufficient amount of energy, vitamins, and minerals to meet their nutritional needs.

7.3.5 Overall Study Limitations

Nutritional care provided to LTC residents is complex and consists of many facets. This study examined four areas of food service delivery providing insight into the variety and nutrient composition of food offered to and consumed by the elderly, their food service satisfaction, and menu planning practices. One area that was not included in this study was the nutritional status of the subjects. This is an important component as nutritional status could be directly influenced by poor nutritional intake, poorly designed cycle menu in terms of variety and nutrient content, and residents unsatisfied with their food service delivery system. This study provided baseline information about the LTC food service delivery system, but did not show whether or not the findings of the study positively or negatively affected residents nutritional status and/or quality of life.

7.4 Future Research

In LTC facilities, many perspectives of care exist. In terms of food service satisfaction it would be valuable to develop tools to examine food service satisfaction of residents through employee, family members, and friends as difficulties exist in obtaining satisfaction from cognitively impaired populations.

The results of the food service satisfaction survey indicate that tools are needed to assess satisfaction of cognitively-impaired residents as poor nutritional status further compromises the health and well-being of these patients. Dementia is one of the most common psychiatric problems affecting the elderly (Lesser, 1999). It is a clinical syndrome of chronic impairment that affects memory, conceptualization, language, judgement, gnosis, executive function, and insight (Lesser, 1999). In the course of dementia progression, however, individuals may enter into various stages of cognitive decline such as mild, moderate and severe impairment, each of which has specific identifiable characteristics. Individuals with mild to moderate cognitive decline remain oriented to time and place, and have memory capabilities as compared to individuals with severe cognitive impairment. Cognitive impairment, such as seen in early stage dementia,

may make communication difficult, but not impossible. To our knowledge, there are no studies that examine food service satisfaction of LTC residents with early dementia (mild to moderate).

Snack delivery and intake is an important consideration that emerged from this study. Residents did not consume an adequate supply of energy and nutrients from the consumption of three meals per day. Thus, there is a need to examine the role that snack consumption can play in helping residents achieve adequate nutrition. Future research should examine the impact of snacks and/or supplements between meals to determine whether dietary intakes and nutritional status among residents improve. Related to this assessment is the examination of food and nutritional supplementation as a determinant of adequate nutrition and of residents' quality of life.

The results of this study may impact on policy decisions and the development of new standards, policies, and procedures governing the delivery of food and nutrition services to elderly residents residing in LTC facilities in Saskatchewan and in Canada. Further research is needed in the assessment and evaluation of the current LTC food service delivery policies used in Canadian provinces.

The proposed ROCIE Food Service Systems Model presents a framework for exploring the quality and effectiveness of a food service delivery system. The model identifies a set of interrelated internal and external factors that are critical to food service delivery. Applications of the model need to be tested to further define the components and the relationships between and among the model's components. The utility of the model should be tested to determine if it can predict specified outcomes as a function of either the transformation of resources or of the controlling factors (or both). For example, a reasonable test of the model would be to compare a food service delivery system with a poorly developed budget to a similarly equipped system with a well prepared operating budget (Resources). Similarly, another test of the model could be to examine outcomes between systems that differ in their effective implementation of policies and procedures (Controlling Factors). The ROCIE model has potential to become a promising way to explore food service systems.

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APPENDIX A

Saskatoon District Health Special Care Homes

**Saskatoon District Health
Special Care Homes - September 2000**

Central Haven Special Care Home
1020 Avenue I North
Saskatoon, Saskatchewan
S7L 2H7

Circle Drive Special Care Home
P.O. Box 60020
3055 Preston Avenue
Saskatoon, Saskatchewan
S7K 7L2

Dalmeny Spruce Manor Special Care Home
Box 190
Dalmeny, Saskatchewan
S0K 1E0

Extendicare Special Care Home
2225 Preston Avenue
Saskatoon, Saskatchewan
S7J 2E7

Langham Senior Citizen's Home
Box 287
Langham, Saskatchewan
S0K 2L0

Lutheran Sunset Home
1212 Osler Street
Saskatoon, Saskatchewan
S7N 0T9

Parkridge Centre
110 Gropper Crescent
Saskatoon, Saskatchewan
S7M 5N9

Porteous Lodge
833 Avenue P North
Saskatoon, Saskatchewan
S7L 2W5

Oliver Lodge
1405 Faulkner Crescent
Saskatoon, Saskatchewan
S7L 3R5

St. Ann's Home
2910 Louise Street
Saskatoon, Saskatchewan
S7J 3L8

St. Joseph's Home
33 Valens Drive
Saskatoon, Saskatchewan
S7L 3S2

Salvation Army Eventide Home
2221 Adelaide Street
Saskatoon, Saskatchewan
S7L 0J6

Saskatoon Convalescent Home
101-31 Street West
Saskatoon, Saskatchewan
S7L 0P6

Sherbrooke Community Centre
301 Acadia Drive
Saskatoon, Saskatchewan
S7H 2E7

Stensrud Lodge
2202 McEown Avenue
Saskatoon, Saskatchewan
S7J 3L6

Sunnyside Nursing Home
2200 St. Henry Avenue
Saskatoon, Saskatchewan
S7M 0P5

Veteran's Home
2109 Preston Avenue
Saskatoon, Saskatchewan
S7J 2E7

Warman Mennonite Special Care Home
Third Avenue, Box 100
Warman, Saskatchewan
S0K 4S0

APPENDIX B

Presentation Outline for SDH Special Care Home Administrators' Meeting June 26,
1997 and Food Service Representatives Meeting November 12 and 13, 1997

1 ☐ Evaluation of Food Services in SDH Special Care Homes

Purpose: To obtain baseline information to guide strategic planning and future evaluation of the food and nutrition services provided by SDH special care homes.

2 ☐ Research Team

- *Joan Smith, Director of Food & Nutrition Services, SDH;*
- *Gordon Zello, Associate Professor of Nutrition, U of S;*
- *David Gibson, General Manager of Continuing Care & Geriatric Services, SDH;*
- *Roberta Gallagher, Manager Food & Nutrition Services, Parkridge Centre/Sherbrooke Community Centre;*
- *Christina Lengyel, Dietitian & Nutrition Graduate Student, U of S.*

3 ☐ Background Information

■ Population Demographics

- Saskatchewan has the highest percentage of older adults.
- 15% of Saskatchewan residents are seniors (44.5% male & 55.5% female).
- 6.4% of elderly Canadians live in special care homes (1991 Canadian Census).

4 ☐ Background Information (cont'd)

■ Nutritional Needs of the Elderly

- Older adults experience physiological, physical and social changes such as:
 - decreased metabolic rates
 - diminished taste acuity
 - difficulty with chewing
 - alterations in the digestion and absorption of food
 - participation in little or no physical activity
 - loss of appetite or disinterest in food
- Older adults tend to have more medical problems and require multiple medications.

5 ☐ Background Information (cont'd)

■ Quality of Life

- Eating is considered one of the most important aspects of daily life experienced by residents of special care homes.
- SDH developed *Standards For Quality of Life, Long Term Care Division, which addresses the residents' need and right to:*
 - *receive competent care in a safe environment,*
 - *exercise personal choice in how their care is to be given*

6 ☐ Background Information (cont'd)

■ Food Service & Nutrition Standards

- Health care reform in 1992 shifted the accountability for food and nutrition services to the districts.
- No changes have occurred in SDH to replace lost services (i.e. consultant dietitian and a continuing care consultant).

- Existing food and nutrition guidelines for the special care homes are neither comprehensive nor current.
- Mandatory accreditation procedures do not exist for special care homes in Canada to ensure the nutritional and social needs of elderly residents are being met.

7 ☐ Objectives

- Gather demographic and foodservice data regarding:
 - each special care home
 - resident population
 - staff and volunteers involved in food and nutrition services
 - food delivery services and method of administration
- Identify the standards, philosophies and policies governing the planning and delivery of food and nutrition services to elderly residents.
- Assess the satisfaction of the elderly residents with the meals and foodservices they receive.
- Assess the residents' perception of quality of life issues related to eating.
- Assess the nutritional adequacy of menus.
- Assess nutrient intakes of selected residents.

8 ☐ Methods

- The research objectives will be accomplished over a two-year period, through completion of the following steps:
 - ethical approval,
 - demographic and foodservice survey,
 - resident foodservice satisfaction survey,
 - nutritional analysis of menus,
 - actual dietary intakes of selected residents,
 - medical chart review,
 - statistical analysis,
 - reporting of results and feedback to participants.

9 ☐ Significance

- The research will:
 - provide information regarding types of diets currently required by elderly residents and dietary practices implemented in special care homes,
 - evaluate both food quality and food-related quality of life standards,
 - evaluate nutritional adequacy of food offered,

10 ☐ Significance (cont'd)

- Identify successful nutritional practices,
- promote strategic planning to improve the services offered,
- provide baseline measures to which future evaluations and programs can be compared,
- promote interest and participation in evidence-based decision making,
- develop research skills within Food and Nutrition Services and the special care home stakeholders.

APPENDIX C

Follow-up Letter to SDH Special Care Home Administrators' Meeting on June 26, 1997



Food & Nutrition Services
c/o Administrative Office
Ground Floor, St. Paul's Hospital
1702 - 20th Street West
Saskatoon, Saskatchewan
Canada S7M 0Z9
Tel: (306) 655-5081 Fax: (306) 655-5555
E-Mail: smith@sdh.sk.ca



THIS LETTER SENT TO THE ATTACHED ADMINISTRATORS

September 30, 1997

Dear

Re: Evaluation of Food Services in SDH Special Care Homes

Last spring, Christina Lengyel, Dr. Gordon Zeilo and I attended a Special Care Home Administrators' Meeting at Saskatoon City Hospital to discuss the above-named research project. The proposed research would identify successful food and nutrition practices, promote strategic planning to improve the services offered, and provide baseline measures to which future evaluations and programs can be compared. The project was supported by the Administrators present at the meeting.

As we briefly outlined, it is our hope to examine the following issues in each Special Care Home, over a period of approximately two years:

- demographic information (e.g., size, ethnic/religious affiliations, resident age distribution, and therapeutic or texture modifications required)
- foodservice philosophies and practices
- nutritional analysis of menus
- actual dietary intake of selected residents
- residents' satisfaction with the food and foodservice they receive
- residents' perception of quality of life issues related to eating

This project represents a collaborative effort between SDH Continuing Care & Geriatric Services and Food & Nutrition Services, with research expertise from the University of Saskatchewan. Partial funding has been obtained from the SDH Research Development Fund, and ethical approval from the University of Saskatchewan has been obtained.

WORKING TOGETHER TO IMPROVE HEALTH

We now need your assistance. Please advise your key food services staff that they will be contacted over the next few weeks by Christina Lengyel, a dietitian and graduate student in the College of Pharmacy and Nutrition. She will arrange meetings to explain the research objectives and solicit their input on all aspects of the project.

Feel free to contact me directly (655-5081) if you have any questions or concerns at this time. I appreciate your assistance.

Sincerely,

Joan Smith, Ph.D., P.Dt.
Director
Food & Nutrition Services

APPENDIX D

University of Saskatchewan Ethics Confirmation



UNIVERSITY ADVISORY COMMITTEE
ON ETHICS IN HUMAN EXPERIMENTATION

(Behavioral Sciences)

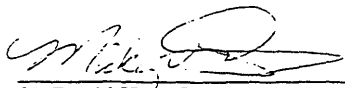
NAME AND EC #: Dr. Gordon A. Zello
& Dr. Joan T. Smith
(Christina O. Lengyel)
College of Pharmacy & Nutrition

97-122

DATE: September 22, 1997

The University Advisory Committee on Ethics in Human Experimentation (Behavioral Sciences) has reviewed the revisions to your study, "Foodservices Satisfaction and Nutritional Adequacy of Food Offered and Consumed in Saskatoon District Health Special Care Homes" (97-122).

1. Your study has been APPROVED.
2. Any significant changes to your protocol should be reported to the Chair for Committee consideration in advance of its implementation.
3. The term of this approval is for 3 years.


for David Hay, Chair
University Advisory Committee
on Ethics in Human Experimentation
Behavioral Sciences

Please direct all correspondence to:

Secretary
UACEHE, Behavioral Science
Office of Research Services
University of Saskatchewan
Room 210 Kirk Hall, 117 Science Place
Saskatoon, SK S7N 5C8

APPENDIX E

Sherbrooke Community Centre Ethics Confirmation



Sherbrooke Community Centre
301 Acadia Drive
Saskatoon, Saskatchewan
S7H 2E7

Tel: (306) 655-3600
Fax: (306) 655-3688

December 3, 1997

Christina Lengyel
Research Co-ordinator
College of Pharmacy and Nutrition
University of Saskatchewan
110 Science Place
Saskatoon, Sask., S7N 5C9

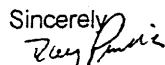
**Re: Sherbrooke Community Centre Ethics Committee Consideration of the study:
"Food Satisfaction and Nutritional Adequacy of Food Offered and Consumed in SDH
Special Care Homes".**

Dear Ms. Lengyel:

Further to my letter of October 29, I write to inform you that the Sherbrooke Ethics Committee has given your proposal favourable consideration.

The Committee noted in particular that the proposal was thorough, allowed choice of engagement and disengagement, would employ informed consent for participation, and that all information would be treated as confidential. The usefulness of the study to resident well being in the food service area was recognized including the enhanced ability it would provide service providers to learn how different facilities responded to food service issues.

The Committee endorsed the research as valuable and timely and within ethical parameters of research to be conducted at Sherbrooke. Please proceed.

Sincerely,


Ray Purdie, Chair
Sherbrooke Community Centre Ethics Committee

c Suellen Beatty
Ethics Committee Members

A Saskatoon District Health Affiliated Agency



APPENDIX F

Nutritional Content of Food Offered to the Elderly in Special Care Homes in Saskatoon
District Health: Food Portion List



**Nutritional Content of Food Offered to the Elderly in Special Care Homes in
Saskatoon District Health**

Name: _____
Position: _____
Special Care Home: _____
Telephone Number: _____
Facsimile Number: _____
Date: _____

OBJECTIVES

To examine the nutritional content of menus planned for regular consistency meals and texture modified diets (e.g., minced and pureed).

INSTRUCTIONS

- 1) Send a photocopy of the menu cycle that your facility currently follows. Please update the menu if any changes exist that are not noted on the menu itself
- 2) Send a photocopy of all of the recipes that correspond with week 2 of your current menu cycle.
- 3) Please fill in the attached Food Portion List to indicate what food portions are offered to a resident that has no food restrictions and/or special requests at meals and snacks in your facility. Circle or highlight only the food item(s) offered and fill in the appropriate measure(s). If you already have a standard portion list(s) that clearly indicates standard food portions sizes then please send list(s) and only fill in the attached forms if information is not available through your lists.
- 4) Place the menu cycle and the completed food portion list into the postage paid envelope and send by Thursday, February 19, 1997.

If you have any questions or concerns about the project, feel free to contact me at 966-5831 or by e-mail (lengyel@duke.usask.ca).

Sincerely,

Christina Lengyel
Research Coordinator

College of Pharmacy and Nutrition, University of Saskatchewan
110 Science Place, Saskatoon SK S7N 5C9 Telephone: Pharmacy (306) 966-6327; Nutrition (306) 966-5824 Facsimile: (306) 966-6377

Nutritional Content of Food Offered to the Elderly in Special Care Homes in Saskatoon District
Health
Food Portion List

1. If measure varies with meal, please specify by meal.
2. Please select the appropriate units for the standard measure of foods from the following list:
 - Scoop # 6, 8, 10, 12, 16, 20, etc; millilitres (ml); grams (g); ounces (oz); cups.

Food Category	Standard Measure	Breakfast	Lunch/Dinner	Supper/ Dinner
<u>Juice</u> Sweetened / Unsweetened				
<u>Milk</u> Skim / 1% / 2% / H				
<u>Coffee/Tea</u> Sugar Milk / Evaporated Milk / Powdered Creamer / Milkette (Skim / 1% / 2% / H / ½&½)				
<u>Cereal</u> Hot Cold Milk (Skim / 1% / 2% / H / ½&½)				
Muffin Toast White / Wholewheat / Other: _____ Jam / Jelly Regular/Diet Butter / Margarine				
Pancakes French Toast Syrup Regular/Diet				
Eggs				
Soup Crackers (salted / unsalted)				

Food Category	Standard Measure	Breakfast	Lunch/Dinner	Supper/ Dinner
<u>Sandwich</u> Bread _____ White / Wholewheat / Other: _____ Spread _____ Mayonnaise / Butter / Margarine / Mustard Vegetables _____ Tomato / Lettuce / Cucumber / Bean Sprouts Other: _____ Sliced Meats _____ Garnish _____ Examples: _____				
<u>Cheese</u> Slices (Skim / 1% / 2%) Cheddar Mozzarella Other: _____				
<u>Salad</u> Tossed _____ Salad Dressing / Oil & Vinegar Potato / Pasta _____ Other: _____				
<u>Main Entree</u> Pasta Casserole Stew Cabbage Rolls Perogies Roast Meats Chicken Fish Bacon Sausage Portion Cuts (cutlets, minute steak, pork chops) Specify: _____ _____ _____ Minced Pureed Gravy Other: _____ _____ _____				

Food Category	Standard Measure	Breakfast	Lunch/Dinner	Supper/ Dinner
<u>Potato</u> Baked Roasted Mashed Scalloped Other: _____ _____ _____				
Rice				
<u>Vegetable</u> Minced Pureed				
<u>Dessert</u> Fresh Fruit Orange Grapes Melon Berries Canned Fruit Stewed Rhubarb Pudding Ice Cream Square Cookie Cake Pie				

Food Category	Standard Measure	Nourishment / Snack		
		Morning (AM)	Afternoon (PM)	Evening (HS)
<u>Juice</u> Sweetened / Unsweetened				
<u>Milk</u> Skim / 1% / 2% / H				
<u>Coffee/Tea</u> Sugar Milk / Evaporated Milk / Powdered Creamer / Milkette (Skim / 1% / 2% / H / ½&½)				
Muffin Bread White / Wholewheat / Other: _____ Crackers (salted / unsalted) Jam / Jelly Regular/Diet Butter / Margarine				
<u>Sandwich</u> Bread White / Wholewheat / Other: _____ Spread Mayonnaise / Butter / Margarine / Mustard Vegetables Tomato / Lettuce / Cucumber / Bean Sprouts Other: _____ Sliced Meats Garnish Examples: _____				
<u>Cheese</u> Slices (Skim / 1% / 2%) Cheddar Mozzarella Other: _____				

Food Category	Standard Measure	Nourishment / Snack		
		Morning (AM)	Afternoon (PM)	Evening (HS)
<u>Dessert</u> Fresh Fruit Orange Grapes Melon Berries Canned Fruit Stewed Rhubarb Pudding Ice Cream Square Cookie Cake Pie				
<u>Other Foods</u> 				

Are there food items that are available at breakfast, lunch, supper and snacks that are not shown on your menu rotation?
If so, please write the food item in the column provided and fill in the appropriate measure.

Please select the appropriate units for the standard measure of foods from the following list:

- Scoop # 6, 8, 10,12, 16, 20, etc; millilitres (ml); grams (g); ounces (oz); cups.

Food Category	Standard Measure
BREAKFAST	
LUNCH/DINNER	
SUPPER/DINNER	

Food Category		Standard Measure
NOURISHMENT/ SNACK		
Morning (AM)		
Afternoon (PM)		
Evening (HS)		

APPENDIX G

Food Service Practices in the Care of the Elderly in Saskatoon District Health Special
Care Homes: Food Service Survey

Foodservice Practices in the Care of the Elderly in Saskatoon District Health
Special Care Homes
PART 2: Foodservice Survey

Name: _____
Position: _____
Special Care Home: _____
Telephone Number: _____
FAX Number: _____
Date: _____

PURPOSE

To learn more about foodservice operations in special care homes in Saskatoon District Health that provide nutritional care to elderly (65 years and older) residents.

OBJECTIVES

For each special care home in Saskatoon District Health, we are asking for foodservice information on the following:

- I. Standards, philosophies and policies governing the planning and delivery of food and nutrition services to elderly residents
- II. Menu planning
- III. Staffing
- IV. Foodservice delivery
- V. Demographics of your Special Care Home
- VI. General Comments

INSTRUCTIONS

- 1) Read the questions carefully and give a response which best describes your foodservice department. All of the responses you give will be held in confidence and only a summary of all of the responses provided by all of the care homes will be presented in the final report.
- 2) Please define any abbreviations used in your responses (e.g., R.A. = resident attendant).
- 3) Your responses to these questions are important. If you are unable to answer any of the questions, please consult with other employees in your care home.
- 4) Feel free to write on the back of each page if you require more space.
- 5) Place the completed questionnaire into the postage paid envelope and return by Wednesday, February 24, 1999.

If you have any questions or concerns about this survey, feel free to contact me at 966-5831 or by e-mail (col665@mail.usask.ca).

Sincerely,

Christina Lengyel
Research Coordinator

**Foodservice Practices in the Care of the Elderly in Saskatoon District Health
Special Care Homes
PART 2: Foodservice Survey**

I. Standards, philosophies and policies governing the planning and delivery of food and nutrition services.

1. What is the mission statement of your care home? Please attach a copy or write below.

2. Do you have a mission statement, philosophy or statement of purpose governing the delivery of food and nutrition services in your care home? **YES** **NO**
If **YES**, please attach a copy or write below.

3. What are the factors that prompt a change in your menus?

4. How do you obtain input from elderly residents in regards to menu planning? Check all that apply.

____ formal resident input: (Please specify from the list below)

____ resident council

____ food satisfaction survey

____ other: _____

____ informal resident input

____ other: _____

5. Listed below are 3 choices. For this section, please circle the response that most closely reflects **your opinion** of the following questions. NOTE: These questions refer to those elderly residents who are not cognitively impaired.

1= NO

2= SOMETIMES

3= YES

- | | | | | |
|-----|--|---|---|---|
| 1. | Are residents able to choose some of the food items that they eat at meals? | 1 | 2 | 3 |
| 2. | Can residents have snacks when they want to? | 1 | 2 | 3 |
| 3. | Are residents given enough time to eat? | 1 | 2 | 3 |
| 4. | Are different meals served for holidays or special occasions? | 1 | 2 | 3 |
| 5. | Do residents have choice in whom they eat with? | 1 | 2 | 3 |
| 6. | Are mealtimes enjoyable for your residents? | 1 | 2 | 3 |
| 7. | Are the meals served on time? | 1 | 2 | 3 |
| 8. | Does the food look appealing? | 1 | 2 | 3 |
| 9. | Do the residents know ahead of time what foods will be served at meals by a menu board, staff or a menu? | 1 | 2 | 3 |
| 10. | Is there a wide assortment of foods served to the residents? | 1 | 2 | 3 |
| 11. | Do you offer seasonal foods to your residents? | 1 | 2 | 3 |

6. What special considerations apply for elderly residents who cannot express choice or who are cognitively impaired?

7. How many employees in your Food and Nutrition Services Department have completed Food Safe Course I and received their certificate in Safe Food Handling? _____

Please provide the job classifications of these employees (e.g., Cook I, Cook II, Dietary Aide, etc.).

8. Does your facility hold inservices for food and nutrition staff? YES NO
If YES, please list the inservices that have been held in the past year.

II. Menu Planning

9. What is the length of your menu cycle in weeks? _____
10. Do you belong to a Group Purchasing Plan? YES NO
If YES, please answer questions 10a and 10b.
- 10a. What is the name of the group?

- 10b. Do you use the menu cycle provided by this group? YES NO
11. Which job classifications have primary responsibility for menu planning at your facility?
Do not include names of employees.

12. When was the last major menu revision at your care home?
____ less than 1 year ago
____ 1 - 2 years ago
____ greater than 2 years ago
13. Do you base your menu planning on any published guidelines? YES NO
If YES, which of the following guidelines do you follow? Circle all that apply.
- A. Canada's Food Guide to Healthy Eating
B. Program Guidelines for Special Care Homes, Saskatchewan Health 1990
C. Other: _____
14. When is your biggest meal provided? Check the one that applies.
____ Lunch/Dinner ____ Supper/Dinner

15. Place a check mark next to the therapeutic diet(s) that have been used for **residents 65 years and older** at your care home in the past year.

<input type="checkbox"/> cardiac	<input type="checkbox"/> high fibre	<input type="checkbox"/> low sodium
<input type="checkbox"/> diabetic	<input type="checkbox"/> high protein	<input type="checkbox"/> renal
<input type="checkbox"/> dysphagia	<input type="checkbox"/> lactose-free	<input type="checkbox"/> renal diabetic
<input type="checkbox"/> gastric	<input type="checkbox"/> low calories/reducing	<input type="checkbox"/> other: _____
<input type="checkbox"/> gluten-free	<input type="checkbox"/> low cholesterol	<input type="checkbox"/> other: _____
<input type="checkbox"/> high energy	<input type="checkbox"/> low fat	<input type="checkbox"/> other: _____
<input type="checkbox"/> high fat	<input type="checkbox"/> low protein	<input type="checkbox"/> tube feed

16. Do you refer to published guidelines when planning **therapeutic diets**?
YES NO

If YES, which of the following guidelines do you follow? Circle all that apply.

- A. Saskatchewan Dietetic Association Diet Manual
B. Good Health Eating Guide
C. Other: _____

17. How rigidly do you follow published therapeutic guidelines?

18. If a resident chooses not to follow his/her given diet, what do you do?

III. Staffing in the Food and Nutrition Services Department

19. In the following table, fill in the information that describes the full time equivalents (FTE's) in the Food and Nutrition Services Department in your care home.

Number of FTE's	Job Classification	Educational Requirements

20. Do your cooks have journeyperson qualifications? YES SOME NO

If NO or SOME, please list the cooking qualifications of those who do not have journeyperson papers.

IV. Foodservice Delivery

21. Mealtimes:

Please give the duration of the meal periods at your care home from start to finish. If you follow a two-seating system, give both times.

1 st Meal Period:			2 nd Meal Period:		
Breakfast:	_____ to _____	AND	Breakfast:	_____ to _____	
Lunch:	_____ to _____	AND	Lunch:	_____ to _____	
Supper:	_____ to _____	AND	Supper:	_____ to _____	

22. Do you provide snacks? YES NO
If YES, what times are they served?

23. What actions do you take if a resident has concerns about the food or its delivery?

24. Please complete the following table, which describes meal service, snack delivery, and feeding assistance provided to elderly residents.

	Job Classification	Role in Meal Delivery (Brief description of task performed)	Assists in Feeding Residents Yes or No	Assists in Delivery of Snacks Yes or No
Food Service Staff				
Staff external to Food Service				
Volunteers	N/A			

V. Demographics of Your Special Care Home

25. What is the total number of residents in your facility according to the resident census?

26. How many residents are 65 years of age and older? _____

27. How would you describe the population in your special care home? (Example: Rehabilitation Centre; Geriatric Facility). Please provide a brief description.

28. What level(s) of care are predominant in your facility?

VI. General Comments

29. Do you think that there are any gaps in nutritional services provided to the elderly at your care home? **YES** **NO**
If **YES**, please describe.

30. Are there any specific areas in the nutritional care of the elderly that you would like to know more about?

- ☐ Nutritional Analysis Information of Recipes, Diets, and Menus
☐ Standardized Recipes
☐ Food Safety Information
☐ Dysphagia
☐ Texture Modified Diets (e.g., pureed, minced, etc.).
☐ Others: Please specify _____

Thank you for your participation.

APPENDIX H

The Nutritional Adequacy of Food Consumed by the Elderly in Special Care Homes in
Saskatoon District Health. Actual Dietary Intakes of Elderly Residents:
Subject Information

INSTRUCTIONS

A) In the following table, fill in the information for each resident (those individuals 65 years and older) who will be involved in the dietary intake survey. You may consult with other individuals to answer the questions. Tear out this instruction sheet for easy reference while filling out the survey. Please photocopy additional forms if necessary.

B) Please circle the appropriate symbol(s) in the table based on the definitions provided below:

Sex

F - Female

M - Male

Therapeutic Diet

C - Cardiac

LF - Low Fat

D - Diabetic

HF - High Fibre

R - Renal

E - Regular

LS - Low Salt

O - Other (Please specify. Do not include food allergies)

Texture Type

E - Regular: Foods provided with no texture modifications.

U - Cut-up: Foods provided in bite-size pieces or as finger foods.

G - Dental Soft/Minced/Ground: Foods provided in a minced, mashed, soft or finely grated form.

P - Pureed/Blenderized: Foods provided in a pureed form that is smooth and varies in thickness.

C) If more spaces are required to fill in the table, please write on the back.

If you have any questions or concerns about the project, feel free to contact Christina Lengyel at 966-5831 or by e-mail (col665@mail.usask.ca).

NAME OF CARE HOME: _____
 DATE OF STUDY: _____

**The Nutritional Adequacy of Food Consumed by the Elderly in Special Care Home in Saskatoon District Health
Actual Dietary Intakes of Elderly Residents**

Subject Information

Name (First & Last)	Sex	Room #	Year of Birth	Diet Order		Weight (kg)	Height (cm)
				Therapeutic	Texture Type		
	M / F			C D R LS LF HF E O: _____	E U G P		
	M / F			C D R LS LF HF E O: _____	E U G P		
	M / F			C D R LS LF HF E O: _____	E U G P		
	M / F			C D R LS LF HF E O: _____	E U G P		
	M / F			C D R LS LF HF E O: _____	E U G P		

APPENDIX I

Procedures for Weighing and Estimating Dietary Intakes

Measuring Food Intakes at St. Ann's Special Care Home

Requirements

- prior selection and identification of participants
- a current seating arrangement plan identifying where all participants sit during meals
- plate identification tags for each participant (unlaminated) and matching tags (laminated) for their individual place setting (place tag on the side of the table that they sit).
- a menu identifying the food items to be served to residents on regular diets. A pre-recorded list of food items to be served for breakfast, lunch and dinner should be prepared.
- a reliable and pre-tested electronic food scale
- **Christina** is responsible for estimating the quantity of food that is offered and consumed by the residents being observed. She also delivers the food to the residents and collects all of their dishes and condiment containers when they are finished their meal.
- **Charity/Rae** are responsible for weighing food prior to its delivery to the participants and re-weighing the leftover food after they have completed their meal. Charity/Rae are also responsible for taking before and after photographs of the food given to each participant.

Procedure

1. Ensure scale is functioning properly prior to weight measurements. Ask cooks to turn off fans during meal service.
2. **Rae/Charity:** Record the identification numbers of each participant on your dietary intake sheet and organize it so you know which plate is going to which resident.
Christina: Alternate the order of meal delivery to residents.
3. **Rae/Charity:** Weigh all food items served to residents. Before meal service, weigh dry items, beverages, desserts (place laminated subject identification tags next to each dessert) and condiments. Take a photograph of the dessert served to each participant. During meals, ask the cook to plate each food item separately for the participants. Tare/zero the scale for each food item and record the weights on the dietary intake sheet. Do the same for soup.
Christina: Estimate the quantity of the dry items, beverages, desserts and condiments given to the participants before meal service and record on the dietary intake sheet. When each food item is placed on the plate, while in the kitchen opposite the scale, estimate food offered.
4. **Rae/Charity:** Once the plate has been filled with all of the food items, place the plate on the beige placement. Place the unlaminated subject identification and meal tags on the right-hand side below the plate. Place the two rulers beside the

plate (one on the right-hand side and one on the bottom) and take a photograph. Make sure that there is about 1 inch of the beige placemat showing below the bottom ruler in the camera viewer before you take the picture.

5. **Christina:** Deliver the plate to the appropriate participant with the matching tag on their table.
6. **Christina:** For each participant, collect all of their dishes and silverware on a tray in the order the meals are finished. When collecting the plates, estimate the amount of food eaten and record the amounts on the dietary intake sheet. Give plates to Rae/Charity to weigh and tell them which resident number the tray is from.
7. **Rae/Charity:** Place the plate on the beige placemat. Place the identification tag, meal tag, and rulers beside it and take a photograph.
8. **Rae/Charity:** To weigh the leftovers:
 - place another clean plate on scale and tare/zero scale
 - with a spatula, scrape the food items one by one unto the clean plate and record the weights for each food item as per instructions stated above. Tare/zero between each food item.
- **Beverages:** Rae/Charity weigh items that are pre-poured before the meal. **Christina** estimates all beverages.
- **Refills:** **Christina** watches for these and estimates.
- **Condiments:** **Rae/Charity** weigh all the condiments used. **Christina** estimates all of the condiments used and saves any empty containers or packages.
- **Snacks:** Will be recorded by the recreation director/aides.

St. Ann's - February 1999

Measuring Food Intakes at Central Haven Special Care Home

Requirements

- prior selection and identification of participants
- a current seating arrangement plan identifying where all participants sit during meals
- plate identification tags for each participant (unlaminated) and matching tags (laminated) for their individual place setting (place tag on the table base on the side that they sit).
- a menu identifying the food items to be served to residents on regular diets. A pre-recorded list of food items to be served for breakfast, lunch and dinner should be prepared.
- a reliable and pre-tested electronic food scale
- **Christina** is responsible for estimating the quantity of food that is offered and consumed by the residents being observed. She also delivers the food to the residents and collects all of their dishes and condiment containers when they are finished their meal.
- **Rae** is responsible for weighing food prior to its delivery to the participants and re-weighing the leftover food after they have completed their meal. Rae is also responsible for taking before and after photographs of the food given to each participant.

Procedure

1. Ensure scale is functioning properly prior to weight measurements.
2. **Rae:** Record the identification numbers of each participant on your dietary intake sheet and organize it so you know which plate is going to which resident.
Christina: Alternate the order of meal delivery to residents.
3. **Rae:** Weigh all food items served to residents. Before meal service, weigh dry items, beverages, desserts (place laminated subject identification tags next to each dessert) and condiments. Take a photograph of the dessert served to each participant. During meals, ask the cook to plate each food item separately for the participants. Tare/zero the scale for each food item and record the weights on the dietary intake sheet. Do the same for soup.
Christina: Estimate the quantity of the dry items, beverages, desserts and condiments given to the participants before meal service and record on the dietary intake sheet. When each food item is placed on the plate, while in the kitchen opposite the scale, estimate food offered.

4. **Rae:** Once the plate has been filled with all of the food items, place the plate on the beige placement. Place the unlaminated subject identification and meal tags on the right-hand side below the plate. Place the two rulers beside the plate (one on the right-hand side and one on the bottom) and take a photograph. Make sure that there is about 1 inch of the beige placemat showing below the bottom ruler in the camera viewer before you take the picture.
5. **Christina:** Deliver the plate to the appropriate participant with the matching tag on their table.
6. **Christina:** For each participant, collect all of their dishes and silverware on a tray in the order the meals are finished. When collecting the plates, estimate the amount of food eaten and record the amounts on the dietary intake sheet. Give plates to Rae to weigh and tell them which resident number the tray is from.
7. **Rae:** Place the plate on the beige placemat. Place the identification tag, meal tag, and rulers beside it and take a photograph.
8. **Rae:** To weigh the leftovers:
 - Move scale away from the food preparation area. Place scale on a food service cart next to the dish room area.
 - place a clean plate on scale and tare/zero scale
 - with a spatula, scrape the food items one by one unto the clean plate and record the weights for each food item as per instructions stated above. Tare/zero between each food item.
 - **Beverages:** Rae weigh items that are pre-poured before the meal. Christina estimates all beverages.
 - **Refills:** Christina watches for these and estimates.
 - **Condiments:** Rae weigh all the condiments used (including creamers). Christina estimates all of the condiments used and saves any empty containers or packages.
 - **Snacks:** Will be recorded by the recreation director.

Central Haven - May 1999

Measuring Food Intakes at Extencicare Special Care Home

Requirements

- prior selection and identification of participants
- a current seating arrangement plan identifying where all participants sit during meals
- plate identification tags for each participant (unlaminated) and matching tags (laminated) for their individual place setting (place inside table tent).
- a menu identifying the food items to be served to residents on regular diets. A pre-recorded list of food items to be served for breakfast, lunch and dinner should be prepared.
- a reliable and pre-tested electronic food scale
- **Christina** is responsible for estimating the quantity of food that is offered and consumed by the residents being observed. She also delivers the food to the residents and collects all of their dishes and condiment containers when they are finished their meal.
- **Rae** is responsible for weighing food prior to its delivery to the participants and re-weighing the leftover food after they have completed their meal. Rae is also responsible for taking before and after photographs of the food given to each participant.

Procedure

1. Ensure scale is functioning properly prior to weight measurements.
2. **Rae:** Record the identification numbers of each participant on your dietary intake sheet and organize it so you know which plate is going to which resident.
Christina: Alternate the order of meal delivery to residents.
3. **Rae:** Weigh all food items served to residents. Before meal service, weigh dry items, beverages, desserts (place laminated subject identification tags next to each dessert) and condiments. Take a photograph of the dessert served to each participant. During meals, ask the cook to plate each food item separately for the participants. Tare/zero the scale for each food item and record the weights on the dietary intake sheet. Do the same for soup.
Christina: Estimate the quantity of the dry items, beverages, desserts and condiments given to the participants before meal service and record on the dietary intake sheet. When each food item is placed on the plate, while in the kitchen opposite the scale, estimate food offered.
4. **Rae:** Once the plate has been filled with all of the food items, place the plate on the beige placement. Place the unlaminated subject identification and meal tags on the right-hand side below the plate. Place the two rulers beside the plate (one on the right-hand side and one on the bottom) and take a photograph. Make sure that there is about 1 inch of the beige placemat showing below the bottom ruler in the camera viewer before you take the picture.

5. **Christina:** Deliver the plate to the appropriate participant with the matching tag on their table. Also, deliver meals to the remaining residents at those tables.
6. **Christina:** For each participant, collect all of their dishes and silverware on a tray in the order the meals are finished. When collecting the plates, estimate the amount of food eaten and record the amounts on the dietary intake sheet. Give plates to Rae to weigh and tell them which resident number the tray is from.
7. **Rae:** Place the plate on the beige placemat. Place the identification tag, meal tag, and rulers beside it and take a photograph. Only take pictures of leftovers from supper, as the lunch meal is too busy.
8. **Rae:** To weigh the leftovers:
 - place a clean plate on scale and tare/zero scale
 - with a spatula, scrape the food items one by one unto the clean plate and record the weights for each food item as per instructions stated above. Tare/zero between each food item.
 - **Beverages:** Rae weigh items that are pre-poured before the meal. **Christina** estimates all beverages.
 - **Refills:** **Christina** watches for these and estimates.
 - **Condiments:** **Rae** weigh all the condiments used (including creamers). **Christina** estimates all of the condiments used and saves any empty containers or packages.
 - **Snacks:** Will be recorded by the resident attendants.

Extendicare - May 1999

Measuring Food Intakes at Dalmeny Spruce Manor Special Care Home

Requirements

- prior selection and identification of participants
- a current seating arrangement plan identifying where all participants sit during meals
- plate identification tags for each participant (unlaminated).
- Write each participants' full name and number on masking tape and stick onto the table at their place setting.
- a menu identifying the food items to be served to residents on regular diets. A pre-recorded list of food items to be served for breakfast, lunch and dinner should be prepared.
- a reliable and pre-tested electronic food scale
- Christina is responsible for estimating the quantity of food that is offered and consumed by the residents being observed. She also delivers the food to the residents and collects all of their dishes and condiment containers when they are finished their meal.
- Rae is responsible for weighing food prior to its delivery to the participants and re-weighing the leftover food after they have completed their meal. Rae is also responsible for taking before and after photographs of the food given to each participant.

Procedure

1. Ensure scale is functioning properly prior to weight measurements.
2. **Rae:** Record the identification numbers of each participant on your dietary intake sheet and organize it so you know which plate is going to which resident.
Christina: Alternate the order of meal delivery to residents.
3. **Rae:** Weigh all food items served to residents. Before meal service, weigh dry items, beverages, desserts (place laminated subject identification tags next to each dessert) and condiments. Take a photograph of the dessert served to each participant. During meals, ask the cook to plate each food item separately for the participants. Tare/zero the scale for each food item and record the weights on the dietary intake sheet. Do the same for soup.
Christina: Estimate the quantity of the dry items, beverages, desserts and condiments given to the participants before meal service and record on the dietary intake sheet. When each food item is placed on the plate, while in the kitchen opposite the scale, estimate food offered.

4. **Rae:** Once the plate has been filled with all of the food items, place the plate on the beige placement. Place the unlaminated subject identification and meal tags on the right-hand side below the plate. Place the two rulers beside the plate (one on the right-hand side and one on the bottom) and take a photograph. Make sure that there is about 1 inch of the beige placemat showing below the bottom ruler in the camera viewer before you take the picture.
5. **Christina:** Deliver the plate to the appropriate participant with the matching tag on their table. Also, deliver meals to the remaining residents at those tables.
6. **Christina:** For each participant, collect all of their dishes and silverware on a tray in the order the meals are finished. When collecting the plates, estimate the amount of food eaten and record the amounts on the dietary intake sheet. Give plates to Rae to weigh and tell them which resident number the tray is from.
7. **Rae:** Place the plate on the beige placemat. Place the identification tag, meal tag, and rulers beside it and take a photograph.
8. **Rae:** To weigh the leftovers:
 - Move scale away from the food preparation area. Place scale on a foodservice cart next to the dishroom area.
 - place a clean plate on scale and tare/zero scale
 - with a spatula, scrape the food items one by one unto the clean plate and record the weights for each food item as per instructions stated above. Tare/zero between each food item.
- **Beverages:** Rae weigh items that are pre-poured before the meal. Christina estimates all beverages.
- **Refills:** Christina watches for these and estimates.
- **Condiments:** Rae weigh all the condiments used (including creamers). Christina estimates all of the condiments used and saves any empty containers or packages.
- **Snacks:** Will be recorded by the nursing attendants.

Dalmeny - June 1999

Measuring Food Intakes at Sherbrooke Community Centre

Requirements

- prior selection and identification of participants
- a current seating arrangement plan identifying where all participants sit during meals
- plate identification tags for each participant (unlaminated) and matching tags (laminated) for their individual place setting (place tag on the table base on the side that they sit).
- a menu identifying the food items to be served to residents on regular diets. A pre-recorded list of food items to be served for breakfast, lunch and dinner should be prepared.
- a reliable and pre-tested electronic food scale
- **Christina** is responsible for estimating the quantity of food that is offered and consumed by the residents being observed. She also delivers the food to the residents and collects all of their dishes and condiment containers when they are finished their meal.
- **Rae** is responsible for weighing food prior to its delivery to the participants and re-weighing the leftover food after they have completed their meal. **Rae** is also responsible for taking before and after photographs of the food given to each participant.

Procedure

1. **Rae:** Ensure scale is functioning properly prior to weight measurements.
Christina: Discuss the procedure with the nursing aides, dietary staff, and other staff assisting with food delivery and feeding.
2. **Rae:** Record the identification numbers of each participant on your dietary intake sheet and organize it so you know which plate is going to which resident.
Christina: Alternate the order of meal delivery to residents.
3. **Rae:** Weigh all food items served to residents. Before meal service, weigh dry items, beverages, desserts (place laminated subject identification tags next to each dessert) and condiments. Take a photograph of the dessert served to each participant. During meals, ask the dietary aide to plate each food item separately for the participants. Tare/zero the scale for each food item and record the weights on the dietary intake sheet. Do the same for soup.
Christina: Estimate the quantity of the dry items, beverages, desserts and condiments given to the participants before meal service and record on the dietary intake sheet. When each food item is placed on the plate, while in the service kitchen opposite the scale, estimate food offered.

4. **Rae:** Once the plate has been filled with all of the food items, place the plate on the beige placement. Place the unlaminated subject identification and meal tags on the right-hand side below the plate. Place the two rulers beside the plate (one on the right-hand side and one on the bottom) and take a photograph. Make sure that there is about 1 inch of the beige placemat showing below the bottom ruler in the camera viewer before you take the picture.
5. **Christina:** Deliver the plate to the appropriate participant with the matching tag on their table.
6. **Christina:** For each participant, collect all of their dishes and silverware on a tray in the order the meals are finished. When collecting the plates, estimate the amount of food eaten and record the amounts on the dietary intake sheet. Give plates to Rae to weigh and tell her which resident number the tray is from.
7. **Rae:** Place the plate on the beige placemat. Place the identification tag, meal tag, and rulers beside it and take a photograph.
8. **Rae:** To weigh the leftovers:
 - place a clean plate on scale and tare/zero scale
 - with a spatula, scrape the food items one by one unto the clean plate and record the weights for each food item as per instructions stated above. Tare/zero between each food item.
- **Beverages:** Rae weighs pre-poured items only. Christina estimates all beverages.
- **Refills:** Christina watches for these and estimates.
- **Condiments:** Rae weighs all the condiments used (including creamers). Christina estimates all of the condiments used and saves any empty containers or packages.
- **Snacks:** Will be recorded by nurse on the ward.

Sherbrooke - July 1999

APPENDIX J

Snacks Form

Resident Snacks

Please record in the following table the snacks eaten by

[illegible]

APPENDIX K

Weighed Dietary Intake Form

INITIALS OF RECORDER: _____

Weighed Dietary Intakes

[illegible]

[illegible]

APPENDIX L

Estimated Dietary Intake Form

[illegible]

DATE OF STUDY: _____

Actual Dietary Intakes of Elderly Residents

Estimated Dietary Intakes

[illegible]

APPENDIX M

Characteristics and Diets of Female Elderly Subjects

Table 8.1. Characteristics and diets of female elderly subjects participating in the study (n=31).

Subject Number	Age ^a	Diet Order: Texture ^{bc}
318	71	Minced
565	75	Regular
763	81	Regular
607	83	Regular
048	83	Regular
575	84	Regular
772	85	Cut-up
521	85	Cut-up
015	85	Regular
906	85	Regular
174	86	Regular
188	86	Regular
564	87	Cut-up
834	87	Regular
413	88	Cut-up
059	90	Regular
375	90	Regular
440	90	Regular
508	91	Cut-up
035	91	Regular
253	91	Regular
312	91	Regular
674	91	Regular
615	92	Regular
530	93	Regular

Subject Number	Age ^a	Diet Order: Texture ^{bc}
348	94	Regular
116	95	Regular
324	97	Minced
300	100	Minced
885	102	Minced
999	103	Regular

a. The mean age of the female subjects was 89 ± 7 years.

b. All of the female subjects consumed a regular diet, non-therapeutic.

c. The percentage of female subjects consuming the following texture types were: regular (71%); cut-up (16%); and minced (13%).

APPENDIX N

Characteristics and Diets of Male Elderly Subjects

Table 8.2. Characteristics and diets of male elderly subjects participating in the study (n=17).

Subject Number	Age ^a	Diet Order: Texture ^{bc}
645	68	Regular
320	71	Minced
758	74	Regular
249	78	Regular
961	82	Minced
091	84	Regular
133	88	Regular
291	88	Regular
357	89	Minced
634	89	Cut-up
816	89	Regular
827	90	Regular
774	91	Regular
062	93	Minced
179	93	Regular
358	96	Minced
213	100	Regular

a. The mean age of the male subjects was 86 ± 9 years.

b. All of the male subjects consumed a regular diet, non-therapeutic.

c. The percentage of male subjects consuming the following texture types were: regular (65%); cut-up (6%); and minced (29%).

APPENDIX O

Nutrient Content of Five Special Care Home Menus

Table 8.3. Energy and macronutrient content of special care home menus^a and comparison to the Canadian recommended nutrient intakes.

Macronutrient	Mean \pm SD	Median	Range	% kcal ^b	% RNI ^c			
					50-74y Males	50-74y Females	75y + Males	75y + Females
Energy ^d								
Calories (kcal)	1792 \pm 133	1785	1620 - 1982		78 (5) ^e	100 (0)	90 (3)	105 (0)
Kilojoules (kJ)	7526 \pm 559				2100 ^f	1600	1800	1500
Protein (g)	72 \pm 8	68	65 - 85	16.0	114 (0) 63	133 (0) 54	122 (0) 59	131 (0) 55
Carbohydrate (g)	232 \pm 15	228	219 - 252	52.0	--	--	--	--
Fat (g)	66 \pm 11	64	55 - 77	33.0	--	--	--	--

a. Group mean of the average of seven days of menus from 5 special care homes.

b. Percentages add up to 101% due to a small error in the conversion of grams to kilocalories using the following standard calculations: (i.e., carbohydrate = 4 kcal/g; protein = 4 kcal/g; fat = 9 kcal/g).

c. RNI = Recommended Nutrient Intakes (Health and Welfare Canada, 1990); Care homes not meeting RNI as indicated by a cutoff of <100% of the specified RNI.

d. Values calculated from the RNI and adjusted by a decrease of 200 kcal/day to account for light physical activity.

e. Number of care homes not meeting RNI.

f. RNI for specified sex and age group in italics.

-- No RNIs for fat and carbohydrate.

Table 8.4. Micronutrient content of special care home menus^a and comparison to recommended levels using dietary reference intakes (DRIs).

Vitamin	Mean \pm SD ^b	Median	Range	% RDA ^{cd}			
				51-70 Males	51-70 Females	70 + Males	70 + Females
Vitamin E (mg)	10.5 \pm 1.2	10.8	8.9 - 11.9	70 (5) 15 ^f	70 (5) 15	70 (5) 15	70 (5) 15
Vitamin C (mg)	77 \pm 20	84	46 - 95	86 (3) 90	103 (2) 75	86 (3) 90	103 (2) 75
Thiamin (mg)	1.4 \pm 0.1	1.3	1.3 - 1.5	117 (0) 1.2	127 (0) 1.1	117 (0) 1.2	127 (0) 1.1
Riboflavin (mg)	1.9 \pm 0.1	1.9	1.8 - 2.1	146 (0) 1.3	173 (0) 1.1	146 (0) 1.3	173 (0) 1.1
Niacin (mg)	15.5 \pm 2.0	14.4	13.6 - 18.1	97 (3) 16	111 (1) 14	97 (3) 16	111 (1) 14
Vitamin B ₆ (mg)	1.3 \pm 0.3	1.3	0.9 - 1.6	76 (5) 1.7	87 (3) 1.5	76 (5) 1.7	87 (3) 1.5
Vitamin B ₁₂ (μ g)	6.9 \pm 5.5	4.4	4.1 - 16.8	288 (0) 2.4	288 (0) 2.4	288 (0) 2.4	288 (0) 2.4
Folate (μ g)	186 \pm 50	203	120 - 238	47 (5) 400	47 (5) 400	47 (5) 400	47 (5) 400

Vitamin	Mean \pm SD ^b	Median	Range	% RDA ^{cd}			
				51-70 Males	51-70 Females	70 + Males	70 + Females
Magnesium (mg)	254 \pm 31	243	214 - 290	60 (5) <i>420</i>	79 (5) <i>320</i>	60 (5) <i>420</i>	79 (5) <i>320</i>
Vitamin A (μ g)	1484 \pm 919	1227	908 - 3105	165 (0) <i>900</i>	212 (0) <i>700</i>	165 (0) <i>900</i>	212 (0) <i>700</i>
Iron (mg)	13.4 \pm .77	13.6	12.1 - 14.1	168 (0) <i>8</i>	168 (0) <i>8</i>	168 (0) <i>8</i>	168 (0) <i>8</i>
Zinc (mg)	9.0 \pm .81	8.5	8.4 - 10.0	82 (5) <i>11</i>	113 (0) <i>8</i>	82 (5) <i>11</i>	113 (0) <i>8</i>
Calcium (mg)	960 \pm 117	1033	821 - 1064	80 (5) <i>1200</i>	80 (5) <i>1200</i>	80 (5) <i>1200</i>	80 (5) <i>1200</i>
Vitamin D (μ g)	7.2 \pm 1.4	7.5	5.4 - 8.7	72 (5) <i>10</i>	72 (5) <i>10</i>	48 (5) <i>15</i>	48 (5) <i>15</i>

a. Group mean of the average of seven days of menus from 5 special care homes.

b. Mean values for vitamin B₁₂ and folate are positively skewed as liver and onions appear on some menus.

c. RDA = Recommended Dietary Allowance (Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, 1997); calculated as a group mean.

d. All nutrients have RDAs, except for calcium and vitamin D which have Adequate Intake (AI) values.

e. Number of care homes not meeting RDA.

f. RDA for specified sex and age group in italics.

APPENDIX P

Demographic Survey



Food Service Practices in Saskatoon District Health
Special Care Homes
PART 1: Demographic and Foodservice Survey

Name: _____
Position: _____
Special Care Home: _____
Telephone Number: _____
Facsimile Number: _____
Date: _____

PURPOSE

To identify residents 65 years and older in the special care homes in Saskatoon District Health who may potentially be able to participate in the research project entitled "Examining Food Service Practices in Saskatoon District Health Special Care Homes".

OBJECTIVES

In each special care home in Saskatoon District Health we will:

1. Determine the total number of residents according to the resident census.
2. Identify residents 65 years and older.
3. Identify potential survey participants and provide the following information about their diet order:
 - Therapeutic: diabetic, renal, cardiac, low fat, low sodium, high fibre, etc.
 - Texture Type: regular, cut-up, dental soft/minced/ground, pureed/blenderized.
4. Identify those residents who are able to indicate an answer to simple, easy to understand questions, verbally or non-verbally.

Sincerely,

Christina Lengyel
Research Coordinator

INSTRUCTIONS

- A) In the following table, fill in the information for each resident in your special care home who is 65 years or older. You may consult with other individuals to answer the questions. Tear out this instruction sheet for easy reference while filling out the survey. Please photocopy additional forms if necessary.
- B) Please circle the appropriate symbol(s) in the table based on the definitions provided below:

Sex

F - Female

M - Male

Therapeutic Diet

C - Cardiac

LF - Low Fat

D - Diabetic

HF - High Fibre

R - Renal

E - Regular

LS - Low Salt

O - Other (Please specify. Do not include food allergies)

Texture Type

E - Regular: Foods provided with no texture modifications.

U - Cut-up: Foods provided in bite-size pieces or as finger foods.

G - Dental Soft/Minced/Ground: Foods provided in a minced, mashed, soft or finely grated form.

P - Pureed/Blenderized: Foods provided in a pureed form that is smooth and varies in thickness.

Is Assistance Required With Meals?

According to the following criteria, please indicate the degree of functional independence each resident 65 years and older has with eating.

NO HELPER REQUIRED

- 1 Complete Independence: Eats from a dish, while managing all consistencies of food, and drinks from a cup or glass with the meal presented in the customary manner on a table or tray. The subject uses a spoon or fork to bring food to the mouth; food is chewed and swallowed.
- 2 Modified Independence: Requires an adaptive or assistive device such as a straw, spork, rocking knife, requires more than a reasonable time to eat, or requires modified food consistency or blenderized food, or there are safety considerations. If the individual relies in part on other means of alimentation, such as a tube feeding, then he/she administers the feedings him/herself.

HELPER REQUIRED

- 3 Supervision or Setup: Requires supervision (e.g., standing by, cuing, or coaxing) or setup (application of an orthopedic appliance); or another person is required to open containers, cut meat, butter bread, or pour liquids.
- 4 Moderate Assistance: Performs 50% of feeding tasks.
- 5 Total Assistance: Performs less than 25% of feeding tasks, or the individual does not eat or drink full meals by mouth, but rely in part on other means of alimentation, such as a tube feeding and does not administer the feedings him/herself.

- C) If more spaces are required to fill in the table, please write on the back.
- D) Place the completed survey into the postage paid envelope and send by **Thursday, February 12, 1998.**

If you have any questions or concerns about the project, feel free to contact Christina Lengyel at 966-5831 or by e-mail (lengyel@duke.usask.ca).

1. What is the total number of residents in your facility according to the resident census?

2. Is there a dominant ethnic or religious affiliation with your special care home? If so, please identify.

Name (First & Last)	Sex	Room #	Year of Birth	Diet Order		Would this resident be able to be interviewed?	Indicate if resident has difficulty understanding English [what language(s) is understood?]	Is assistance required with meals?
				Therapeutic	Texture Type			
	M / F			C D R LS LF HF E O: _____ _____	E U G P	Yes / No		1 2 3 4 5
	M / F			C D R LS LF HF E O: _____ _____	E U G P	Yes / No		1 2 3 4 5
	M / F			C D R LS LF HF E O: _____ _____	E U G P	Yes / No		1 2 3 4 5
	M / F			C D R LS LF HF E O: _____ _____	E U G P	Yes / No		1 2 3 4 5

[illegible]

APPENDIX Q

Consent Forms



Resident Foodservice Survey in Care Homes
in Saskatoon District Health

Consent Form

- PURPOSE:**
- 1) To look at food and food service delivery to elderly residents (those 65 years and older) in care homes.
 - 2) To look at quality of life issues related to the eating habits of elderly residents.

BENEFITS: The information obtained will be used to improve nutrition services in care homes in Saskatoon and the surrounding areas.

In consenting to help with this study, I understand and agree with the following statements:

1. I give permission to be interviewed.
2. I have been able to ask any questions I want about the study, which have been answered to my satisfaction.
3. I understand that I am ensured my privacy, where my identity will remain confidential, if the results are published.
4. I understand that I am free to refuse to answer any of the questions and that I may withdraw my consent and end the interview at anytime, without penalty. The withdrawal or the decision not to participate will not affect my care or the services I receive.
5. The interview is expected to last 20-30 minutes in length. In the event that a follow-up interview is requested, it will be my choice whether or not to participate.

-1-

Research Copy

CONTACTS: If you have any questions with regards to this research project, please do not hesitate to contact any of the researchers listed below:

Christina Lengyel, Research Coordinator, 966-5831 (work)
College of Pharmacy and Nutrition,
University of Saskatchewan.

Dr. Gordon Zello, Associate Professor, 966-5825 (work)
College of Pharmacy and Nutrition,
University of Saskatchewan.

Dr. Joan Smith, Director of Food & 655-1000 (work)
Nutrition Services, Saskatoon District
Health.

I hereby acknowledge that the contents of the consent have been explained to me and that I have received a copy of the consent form for my own records.

Signature of Interviewee

Date

Signature of Interviewer

Date

Signature of Research
Coordinator

Date



Resident Foodservice Survey in Care Homes
in Saskatoon District Health

Consent Form

PURPOSE:

- 1) To look at food and food service delivery to elderly residents (those 65 years and older) in care homes.
- 2) To look at quality of life issues related to the eating habits of elderly residents.

BENEFITS: The information obtained will be used to improve nutrition services in care homes in Saskatoon and the surrounding areas.

In consenting to help with this study, I understand and agree with the following statements:

1. I give permission to be interviewed.
2. I have been able to ask any questions I want about the study, which have been answered to my satisfaction.
3. I understand that I am ensured my privacy, where my identity will remain confidential, if the results are published.
4. I understand that I am free to refuse to answer any of the questions and that I may withdraw my consent and end the interview at anytime, without penalty. The withdrawal or the decision not to participate will not affect my care or the services I receive.
5. The interview is expected to last 20-30 minutes in length. In the event that a follow-up interview is requested, it will be my choice whether or not to participate.

-1-

Participant Copy

CONTACTS: If you have any questions with regards to this research project, please do not hesitate to contact any of the researchers listed below:

Christina Lengyel, Research Coordinator, 966-5831 (work)
College of Pharmacy and Nutrition,
University of Saskatchewan.

Dr. Gordon Zello, Associate Professor, 966-5825 (work)
College of Pharmacy and Nutrition,
University of Saskatchewan.

Dr. Joan Smith, Director of Food & 655-1000 (work)
Nutrition Services, Saskatoon District
Health.

I hereby acknowledge that the contents of the consent have been explained to me and that I have received a copy of the consent form for my own records.

Signature of Interviewee

Date

Signature of Interviewer

Date

Signature of Research
Coordinator

Date

APPENDIX R

Interviewing Training Manual

INTERVIEWING TRAINING MANUAL
Resident Satisfaction Survey in Special Care Homes
in Saskatoon District Health



Training Session with Christina Lengyel
University of Saskatchewan
Room 118 Thorvaldson Building
January 21, 1998
4:00 - 5:00 pm

Interviewing Training Manual

Resident Satisfaction Survey in Special Care Homes in Saskatoon District Health

Objectives of Study

1. To assess the satisfaction of food and food service delivery to elderly residents (those 65 years and older) in special care homes in Saskatoon District Health.
2. To assess quality of life issues related to the eating habits of elderly residents.

Subjects

This study will involve 17 special care homes in Saskatoon District Health. Initially, residents, whom are 65 years and older, will be screened by managers responsible for food and nutrition services for each special care home. The residents who are potential interviewees will be invited to participate in the study.

Interviewer Responsibilities

Face-to-face interviews will be conducted with approximately 700 subjects from February to August 1998. All interviewers will be given a list of subjects to interview that have been previously screened. Each interview will take 15 - 20 minutes. The interviews will be conducted between 9:00am - 11:30am, 1:00pm - 4:30pm and 5:30pm - 6:30pm on days suitable for the special care home, research coordinator, and interviewer. Interviewees are required to sign a consent form. Interviewers are also required to sign a consent form to preserve the confidentiality of the data they collect. This is required by the University of Saskatchewan Advisory Committee on Ethics in Behavioural Science Research.

Survey Interviewing

The object is to draw from respondents information, reactions, or opinions politely, neutrally, and impartially, without the slightest suggestion, verbally or otherwise, of influencing or evaluating the response, before or after it is given (Sincoff and Goyer 1984).

Speaking and Listening

What is effective communication?

1. Concise

Concise refers to compactness. The removal of unnecessary words to make the questions asked clear to the participant.

2. Articulated clearly

The meaning of a question or comment can be altered if the words are not clearly enunciated.

3. Spoken at appropriate speed

The pace (speed) of the interviewer should be slow enough so that the respondent is able to hear each word clearly yet fast enough to prevent the interview from becoming boring or too long. Rapid speech conveys a rushed feeling to the respondent where they may feel hurried to answer the questions and less likely to elaborate on an important aspect and also does not give the respondent enough time to think before answering.

4. Attentive Listening

It is important to let the respondent know that what they have said is important and valuable. Therefore, listening attentively is courteous and displays respect. Good listening includes:

- Wait for the respondent to stop speaking before you stop listening.
- Indicate that you are listening.
- Ask questions if you don't understand something or feel you have missed a point.
- Do not make assumptions about what the respondents are going to say, or mentally try to finish the sentence for them.

5. Spoken in appropriate tone and volume

Tone and volume variations affect the interpretation of the questions being asked. Raised speech volume may indicate authority, whereas low speech volume may indicate intimidation on the part of the interviewer. Neither method is the best way to gain the client's respect, support or cooperation. Interviewers should be alert for any hearing difficulties the respondent may be having and be prepared to adjust the loudness and intonation of their speech to meet the needs of the respondent.

6. Non-judgemental

Avoiding a judgemental attitude in an interview is essential for gathering accurate information. Attitudes and values can be reflected by the interviewer's speech tone and volume. The reactions of the interviewer can influence and change the behaviour of the respondent to the questions remaining. Thus, it is essential that the interviewer remain unaffected by the respondent's answers and does not show any reactions or surprise to the responses given in the interview (Jasmund 1990 p.25-26). It is important to control typical reactions such as:

- inappropriate laughing
- frowning or raising the voice in irritation
- raising the eyebrows or winking the eye
- shuffling the questionnaire or the papers
- making encouraging or displeased sounds such as 'ha', 'tut-tut' or a sigh
- shuffling the feet or other movements indicating impatience or displeasure (Lutz, Lockerbie, Chalmers & Hepburn 1995)

Interviewing Etiquette

- a) Be friendly and gracious to all of the respondents. Treat all individuals as adults; assure the he/she is treated with dignity and compassion.
- b) Respect the client's time. Always ask, "Do you have a few minutes to answer a few questions?" If not, find out when to come back.
- c) Always thank the interviewee for participating and that their input is appreciated and valuable.
- d) Always address the resident as "Mr or Mrs".
- e) Prior to entering a resident's room, knock on the door.
- f) Always introduce yourself.
- g) If a resident asks for help in regards to lifting, do not help, but ask a nurse/care aide for assistance. It is important that you do not lift or move the patient. If required to push the subject in his/her wheelchair, always ask if you can push them.
- h) Conclude the interview on a positive note so that the respondent will think well of you, the research project and the entire experience.

Interviewing Skills

When conducting interviews, it is important to ask questions in a consistent manner. This means that the data is collected uniformly, where all of the questions are asked in the same way. When asking questions refer to the following guidelines:

1. Ask the questions exactly as they are worded in the questionnaire.

The questions should be asked exactly as they are worded in the interview guide, using the same vocal inflections and pronunciation for each respondent.

2. Read each question slowly.

The ideal speed is two words per second!! Remember a slow and deliberate pace gives the respondent time to understand the entire question and to formulate a careful reply.

Although you may be quite familiar with the questionnaire, the questions are new to each respondent, therefore, they all should be given an equal chance to understand and respond to all of the questions.

3. Ask the questions in the order in which they are presented in the questionnaire.

The sequence of the questions are designed to create a sense of continuity and ensure that early questions will not influence the respondent's answers to later questions.

4. Ask every question specified in the questionnaire.

It is important that the respondent is read each question specified in the questionnaire. If the respondent unknowingly gives what you consider an answer to Question 10 while answering Question 3, still ask Question 10 when it appears in the regular order of questions, exactly as it appears and without apology.

5. Repeat questions which are misunderstood or misinterpreted.

a) If the respondent has difficulties understanding the question, the interviewer should repeat the pre-question/preliminary information and then repeat the question and/or use gestures to clarify a statement/question. If the respondent is still unable to answer, the interviewer should record this and go on to the next question. The interviewer should not put questions into his/her own words. Remember, putting a question in different words can easily change the meaning and emphasis of that question.

b) Interviewers should not return, at a later stage, to questions the respondent has left unanswered.

6. Keep track of any changes you make in the questionnaire.

Any changes that are made in the wording, phrasing or order of questions in the interview should be noted in the questionnaire.

GENERAL RULE: Questions should be read to the respondent exactly as given on the questionnaire and in the same order as they appear on the form.

Communication: Tips to Remember

- Communicate in a quiet surrounding as best as possible.
- Establish eye contact
 - 1) Arrange seating and body positioning to optimize eye-to-eye contact with resident. It may be necessary to adjust furniture to facilitate comfortable eye contact if the resident is lying down or sitting in a low seat.
 - 2) Do not turn away in the middle of a sentence
 - 3) Never speak directly into the resident's ear. This prevents the listener from using visual cues.
 - 4) Directly face the resident with light on your face.
 - 5) Allow extra time for the resident to understand and respond. Be patient.
- Speak in a normal tone of voice or with slightly increased volume; shouting or talking loud may be painful and make the speech unclear.
- Do not speed up or over articulate your normal speech. These also distort the sounds and make visual clues more difficult.
- Do not eat, chew gum or cover your mouth when speaking.
- Do not communicate from a distance greater than 3 feet.

How to Handle Difficult Situations

1. The subject is not in his/her room, unable to be reached or has passed away.

If the subject is unable to be reached, interview the next person on the list provided and make a note.

2. The respondent is unco-operative

- a) *refuses the interview altogether*

In this situation, note the refusal on the questionnaire and provide reasons if any are volunteered.

- b) *refuses to continue the interview somewhere in the middle*

Record any comments made as to why the respondent chooses not to continue with the questionnaire.

- c) *completes the information, but it is unclear to the interviewer if the information is truthful and reliable.*

Complete the interview even if there is a possibility information given is unreliable. At the end of the interview record your doubts and suspicions about the interview and briefly indicate any answers that appear particularly suspect.

3. A poor environment

When conducting the survey it is important to communicate with the respondent in areas free of noise, disturbance or other distractions that may influence and distract the respondent or the interviewer. If background noise is present when interviewing a respondent, ask them if anything can be done to lessen the distraction or if a new location to conduct the interview can be found. If the conditions are unsuitable and beyond what can be expected for the study, then explain this to the respondent and try to arrange to come back at another time. Remember to be tactful and polite.

4. Unsuitable respondents

Ill health may make it difficult to conduct the interview. If you happen to encounter a subject with communication difficulties, pain, illness or other challenges, ask them if they are able to or want to participate. If so, arrange another time to see them. If you are unable to interview them, make a note and someone else will be assigned to the resident.

References

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Jupiter T and Spivey V. 1997. Perception of hearing loss and hearing handicap on hearing aid use by nursing home residents. Geriatric Nursing;18(5):201-207.

Lutz W, Lockerbie L, Chalmers J and Hepburn W. 1995. Health and community surveys volume II: A practical manual for health and community workers. London:Macmillan Education Ltd.

Sincoff MZ and Goyer RS. 1984. Interviewing. New York:Macmillan Publishing Company.

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NOTES

APPENDIX S

Special Care Home Newsletter Article

Resident Food Service Survey

Hi, my name is Christina Lengyel. I am a graduate student in the College of Pharmacy and Nutrition at the University of Saskatchewan and I am also a Registered Dietitian. Presently, I am coordinating a project looking at food service practices in Saskatoon District Health Special Care Homes. I will be asking residents, who are 65 years and older, questions on food service issues in August 1998. If you have any questions regarding this project, please contact me at (306) 966-5831 or if you see me, feel free to address your questions, concerns or suggestions.

Thank you for your cooperation.

Christina Lengyel
Research Coordinator

APPENDIX T

Food Service and Quality of Life Domains

Resident Satisfaction Survey in Care Homes in Saskatoon Domains

Definitions:

“Quality of Life”: the assessment of the subjective importance and perceived availability of autonomy, interpersonal relations and security in a long-term environment.

- (1) **Autonomy** - individuality, physical independence, control (over environment), and ability to take part in appropriate and meaningful activities.
- (2) **Security** - physical safety and comfort, order and structure, and the provision of needed care.
- (3) **Interpersonal Relations** - interaction level, friendship, staff relations, expression, respect (Lind 1980 quoted by Grossman & Weiner 1988).

Foodservice: a system of providing customers with quality food and service.

Foodservice	Quality of Life
2. Are your meals served on time?	1. Do you get the help you need during mealtimes?
4. Does the food look appealing?	3. Are you able to choose some of the food items that you eat at meals?
5. Is the hot food hot?	8. Can you have a snack when you want to?
6. Is the cold food cold?	9. Are you given enough time to eat?
7. Are you satisfied with the amount of food given to you?	10. Are different meals served for holidays or special occasions?
11. Do you know ahead of time what foods will be served at meals by a menu board, staff, or a menu?	12. Would you like to have more choice in whom you eat with?
13. Is the food served to you tasty?	14. Is the staff that serve your meals friendly?
15. Is there a wide assortment of foods served to you?	16. If you had any concerns or problems about the food would they be taken seriously by staff?
17. Do you like the types of foods that are served?	18. Would you like to be given more choice in what you eat?
24. Are you happy with the service you receive at mealtimes?	19. Do you enjoy mealtimes?
	20. Do you like the times meals are served?

Foodservice	Quality of Life
	21. Do you feel free to express your concerns or complaints about the food given to you?
	22. Is the place where you eat your meals kept clean?
	23. Are you satisfied with the meals that you receive?
	25. Do you like where you eat your meals?

APPENDIX U

Resident Food Service Survey - Pilot Test

Participant # _____

Resident Satisfaction Survey in Special Care Homes
in Saskatoon District Health

I will ask you a total of 24 statements. For each statement, please respond with strongly disagree, disagree, neither disagree nor agree, agree or strongly agree. All of these responses will be repeated and will be shown on this card (**SHOW RESPONSE CARD**) for each statement. There is no right or wrong answer. Please give the answer you feel is most appropriate for you. If you have any comments, I would appreciate them at the end of the survey.

Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree	Not Applicable
1	2	3	4	5	6

The statements that I will read to you are about food and food service delivery.
Do you agree with the following statements:

- | | | | | | | | |
|----|--|---|---|---|---|---|---|
| 1. | I get the help I need during mealtimes. | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. | Meals are not served on time. | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. | I like the times meals are served. | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. | The food looks appealing. | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. | The hot food is hot. | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. | The cold food is cold. | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. | I am satisfied with the amount of food given to me at meals.
(If residents say strongly disagree or disagree, ask question 7a.) | 1 | 2 | 3 | 4 | 5 | 6 |

7a. At mealtimes, I would like to have: more food less food

Participant # _____

Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree	Not Applicable
1	2	3	4	5	6

- | | | | | | | | |
|-----|--|---|---|---|---|---|---|
| 8. | There is a wide assortment of foods served to me here. | 1 | 2 | 3 | 4 | 5 | 6 |
| 9. | I am able to choose <u>some</u> of the food items that I eat at meals. | 1 | 2 | 3 | 4 | 5 | 6 |
| 10. | Different meals are served for holidays or special occasions. | 1 | 2 | 3 | 4 | 5 | 6 |
| 11. | Most of the time the food served to me is tasty. | 1 | 2 | 3 | 4 | 5 | 6 |
| 12. | I know ahead of time what foods will be served at meals by a menu board, staff, or a menu. | 1 | 2 | 3 | 4 | 5 | 6 |
| 13. | I can have a snack when I want to. | 1 | 2 | 3 | 4 | 5 | 6 |
| 14. | The staff that serve my meals are friendly. | 1 | 2 | 3 | 4 | 5 | 6 |
| 15. | I feel free to express my concerns and complaints about the food given to me. | 1 | 2 | 3 | 4 | 5 | 6 |
| 16. | I know that my concerns or problems about the food or its delivery are taken seriously by staff. | 1 | 2 | 3 | 4 | 5 | 6 |
| 17. | I like the types of foods that are served. | 1 | 2 | 3 | 4 | 5 | 6 |
| 18. | I would like to be given more choice in what I eat. | 1 | 2 | 3 | 4 | 5 | 6 |

Participant # _____

Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree	Not Applicable
1	2	3	4	5	6

19. I enjoy mealtimes. 1 2 3 4 5 6
20. Most of the time I like the foods served for holidays or special occasions. 1 2 3 4 5 6
21. Most of the time I am satisfied with the meals that I receive. 1 2 3 4 5 6
22. I would like to have more choice in who I eat with. 1 2 3 4 5 6
23. I am treated well by staff during mealtimes. 1 2 3 4 5 6
24. I like the environment that I eat in. Environment means the location of where you eat and who you eat with.
(If residents say strongly disagree or disagree, ask question 24a.) 1 2 3 4 5 6

24a. Could you tell me what you do not like about the environment you eat in? (Write comments in the space below).

Participant #_____

This survey is being used for the first time. I wondered if you had any comments or suggestions about the survey. I will use your suggestions to improve the survey for my larger project in the summer.

Thank you for participating in this survey.

APPENDIX V

Resident Food Service Survey in Care Homes in Saskatoon District Health



Interviewing Script

Hello Mr./Mrs. _____.

My name is _____ (first name only). I am a student from the University of Saskatchewan interviewing residents on what they think of the food and nutrition services in their home.

Your name was selected to participate in this survey. We hope that the information we get will be used to improve nutrition services in care homes in Saskatoon and the surrounding areas.

I am here to ask you if you would like to participate in this interview. There are a total of 25 questions and the interview should last approximately 20-30 minutes. We will not include your name so you cannot be identified. Your participation is entirely voluntary and you may choose to stop this interview at any time. To participate, we ask that you sign a consent form. A copy of this consent form will be given to you.

Would you like to be interviewed for this study?

YES

NO →

Thank you for your time.

Is this a convenient time or would you like me to come back at another time?

YES →

Proceed with the consent form, followed by the questionnaire.

NO →

When would you like me to come back? _____
(Arrange a mutually acceptable date and time.)

Participant # _____

Resident Foodservice Survey in Care Homes in Saskatoon

I will ask you a total of 25 questions. For each question, please respond with yes, no, or sometimes. All of these responses will be repeated and will be shown on this card (**SHOW RESPONSE CARD**) for each question. There is no right or wrong answer. Please give the answer you feel is most appropriate for you.

No	Sometimes	Yes	Don't Know	No Response	Not Applicable
1	2	3	4	5	6

The questions that I will ask you are about food and foodservice delivery.

1. Do you get the help you need during mealtimes?
_____ 1 2 3 4 5 6
2. Are your meals served on time?
_____ 1 2 3 4 5 6
3. Are you able to choose some of the food items that you eat at meals? (Example: apple juice vs. orange juice)
_____ 1 2 3 4 5 6
- 4a. Does the food look appealing?
_____ 1 2 3 4 5 6
5. Is the hot food hot?
_____ 1 2 3 4 5 6
6. Is the cold food cold?
_____ 1 2 3 4 5 6
7. Are you satisfied with the amount of food given to you?
- If resident says "no" or "sometimes" ask question 7a.
_____ 1 2 3 4 5 6
- 7a. At mealtimes, do you get: too much food or not enough food
8. Can you have a snack when you want to?
_____ 1 2 3 4 5 6

Participant # _____

No	Sometimes	Yes	Don't Know	No Response	Not Applicable
1	2	3	4	5	6

9. Are you given enough time to eat? 1 2 3 4 5 6
-
10. Are different meals served for holidays or special occasions?
- If resident says "yes" or "sometimes" ask question 10a. 1 2 3 4 5 6
-
- 10a. Do you like the foods that are served for holidays or special occasions? 1 2 3 4 5 6
-
11. Do you know ahead of time what foods will be served at meals by a menu board, staff, or a menu? 1 2 3 4 5 6
-
12. Would you like to have more choice in whom you eat with? 1 2 3 4 5 6
-
13. Is the food served to you tasty? 1 2 3 4 5 6
-
14. Is the staff that serve your meals friendly? 1 2 3 4 5 6
-
15. Is there a wide assortment of foods served to you?(variety) 1 2 3 4 5 6
-
16. If you had any concerns or problems about the food would they be taken seriously by staff? 1 2 3 4 5 6
-

Participant # _____

No	Sometimes	Yes	Don't Know	No Response	Not Applicable
1	2	3	4	5	6

17. Do you like the types of foods that are served? 1 2 3 4 5 6
-
18. Would you like to be given more choice in what you eat? 1 2 3 4 5 6
-
19. Do you enjoy mealtimes? 1 2 3 4 5 6
-
20. Do you like the times meals are served? 1 2 3 4 5 6
-
21. Do you feel free to express your concerns or complaints about the food given to you? 1 2 3 4 5 6
-
22. Is the place where you eat your meals kept clean? 1 2 3 4 5 6
-
- 4b. Does the food look appealing? 1 2 3 4 5 6
-
23. Are you satisfied with the meals that you receive? 1 2 3 4 5 6
-
24. Are you happy with the service you receive at mealtimes? 1 2 3 4 5 6
-
25. Do you like where you eat your meals?
- If resident says "no" or "sometimes" ask question 25a. 1 2 3 4 5 6
-

Participant # _____

25a. Could you tell me what you do not like about where you eat?
(Write comments in the space below).

Thank you for participating in this survey.

Participant # _____

This section is to be completed in private by the surveyor at the end of the interview:

Participant Number _____

Special Care Home _____

All questions complete? Yes No

Last question completely answered by respondent _____

Did you edit any of the questions? Yes No

If 'Yes', how did you edit the questions? Which ones? _____

Comments:

Surveyor Name: _____

Date Completed: _____

Time Completed: _____

=====